Virtual Weather Station Version 11

User's Manual

For Davis Instruments Vantage, Vantage Pro, Weather Monitor II, Weather Wizard III, Oregon Scientific WMR-918 (cable free), Oregon Scientific WMR-968 (cable free), Huger WMR-968H (cable free), Oregon Scientific WM-918, Huger WM-918H, Radio Shack WX-200, Radio Shack 63-1016 Wireless, Peet Bros Ultimeter100/800/2000, Rainwise WS-2000 and WT-2000 Weather Stations, Texas Weather Instruments Weather Stations, 1-Wire Weather Station, RxComm and Columbia Weather Systems Weather Stations

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1 General Description

Virtual Weather Station is a software package that allows you to connect your personal computer to your weather station to display, plot and store data for comprehensive monitoring and analysis.

Virtual Weather Station brings your PC to life with a rich array of dynamic and colorful gauges, dials, graphs and charts. The desktop is completely customizable - you can arrange the virtual instruments based on your own personal preferences or application. You have literally over 1000 ways to display your data.

You do not even need a station to operate Virtual Weather Station. The data can be collected across a network, or downloaded from a METAR compatible weather station.

Virtual Weather Station runs on any Windows 32-bit operating system (95/98/NT/2000/ME/XP).

2 Virtual Weather Station Editions

There are three editions of Virtual Weather Station, based on features:

1. Virtual Weather Station Base Version. This version provides real-time display of the weather parameters.
2. Virtual Weather Station Pro Edition (formally Weather Lab). This version adds detailed data analysis and reports.
3. Virtual Weather Station Internet Edition. This version provides all of the features in the Base and Pro Edition and adds Internet features.

This manual is separated into the three editions.

3 Weather Station Part Numbers

The software operates with Davis Instruments, Oregon Scientific, Huger, Rainwise and Radio Shack weather stations.

Table 1 - Station Part Numbers and Corresponding Reference in Virtual Weather Station provides a cross reference if your station's part number is different.

Manufacturer	Part Number	Corresponding Reference in Virtual Weather Station
Accuweather	63-1016	WMR-968
Davis Instruments	Vantage Pro	Vantage Pro

Davis Instruments	Vantage Pro Plus	Vantage Pro Plus
Davis Instruments	Weather Monitor II	WeatherLink
Davis Instruments	Weather Wizard III	WeatherLink
Oregon Scientific	WM-918	WM-918
Oregon Scientific	WMR-918	WMR-918
Oregon Scientific	WMR-968	WMR-968
Huger	WMR-918H	WMR-918
Huger	WM-918H	WM-918
Radio Shack	WX-200	WM-918
Rainwise	WS-2000	Rainwise
Rainwise	WT-2000	Rainwise
Peet Bros	100 / 800 / 2000	Peet Bros
Texas Weather Instruments	1-Wire Weather Stations	Texas Weather Instruments
AAG 1-Wire Weather Station		1-Wire
RxComm		Peet Bros
Columbia Weather Systems	Capricorn II, Capricorn 2000	Columbia Weather Systems

Table 1 - Station Part Numbers and Corresponding Reference in Virtual Weather Station

4 Hardware and Software Requirements and Display Preferences

4.1 Hardware and Software Requirements

The following hardware is required for communicating to the Weather Station:

- PC running Windows 95, 98, NT 4.0 (or greater), 2000, ME and XP with at least 10 MB of free disk space

- 8MB RAM
- Serial Communication Port
- Serial Cable

4.2 Display Preferences

- Virtual Weather Station prefers high resolution or 16-bit color. Some images may result in poor quality at lower resolution settings.
- Virtual Weather Station is best viewed at 800 x 600 pixels or greater.
- Power or Energy saving features may result in distorted jpeg images.

5 Getting Started

HINT: Menu Shortcuts are displayed in blue font.

5.1 Installing the Software

To install the software, run the following:

- **setup.exe**

If transferring the files to your hard drive, copy all of the files to a common directory and run **setup.exe**.

5.2 Connecting Your Communication Port to the Weather Station

5.2.1 Oregon Scientific, Radio Shack and Huger Weather Stations

Connect your weather station directly to your PC using a standard DB9M/DB9F serial or RS-232 cable (supplied by Ambient, LLC). The serial port on your computer is generally a 9-pin, male connector, similar to the 9-pin female RS-232 connector on your weather station.

5.2.2 Rainwise Weather Stations

Connect your weather station directly to your PC using the cable provided with your Rainwise Computer Interface.

5.2.3 Davis Instruments

Connection to the weather station requires the WeatherLink module.

5.3 Running Virtual Weather Station

Connect a serial cable to your computer's comport and verify your Weather Station is turned on.

Run Virtual Weather Station from the Virtual Weather Station icon.

5.4 License Information

- **Menu Shortcut: Help ▶ Registration Information**

Enter the license information provided from online registration or the inside cover of the CD. The software includes a 30-day fully functional trial period.

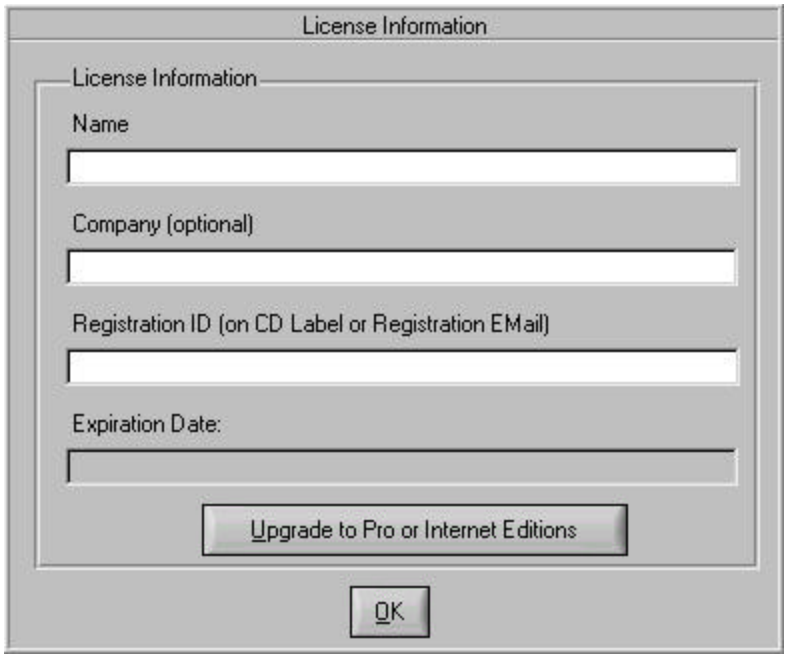


Figure 1 - License Information

5.5 Upgrade to Pro or Internet Editions

To upgrade to Virtual Weather Station Pro or the Internet Editions, contact Ambient for upgrade costs. A registration number will be sent to you via Email. Enter this registration number by selecting the Upgrade button.

6 Virtual Weather Station Base Edition Features

6.1 The Assistant

- **Menu Shortcut: Help ▶ Assistant**

If you are a new user, it is advisable that you completely run through the assistant to understand all of the features of Virtual Weather Station.

When launching Virtual Weather Station for the first time, the Assistant will automatically be displayed.

Assistant
Assistant
The Assistant guides you through the steps required to connect to your weather station, customize your displays and log data and graphical web page images.
Note that right clicking on many elements on the desktop provide help messages. Press the forward arrows to advance [>>] and the reverse arrows to return [<<].
Conversions
Communication
Station Settings
Customizing Displays
General Display Settings
Database
File Settings
Jpeg File Settings
Advanced Parameter Settings
Complete Parameter List
Daily Summary
Archive Memory
Complete
Close
<<
>>

Figure 2 - The Assistant

6.2 Conversions

- **Menu Shortcut: Settings ▶ Conversions**

6.2.1 Unit Conversions

You may select the units of measure in which the data is displayed throughout the software. All program windows and files will display these units.

6.2.2 Total Rain Offset

You can account for year to date rain by entering a total rain offset in the numerical field. Note that your weather station may not accurately display the year to date rain total.

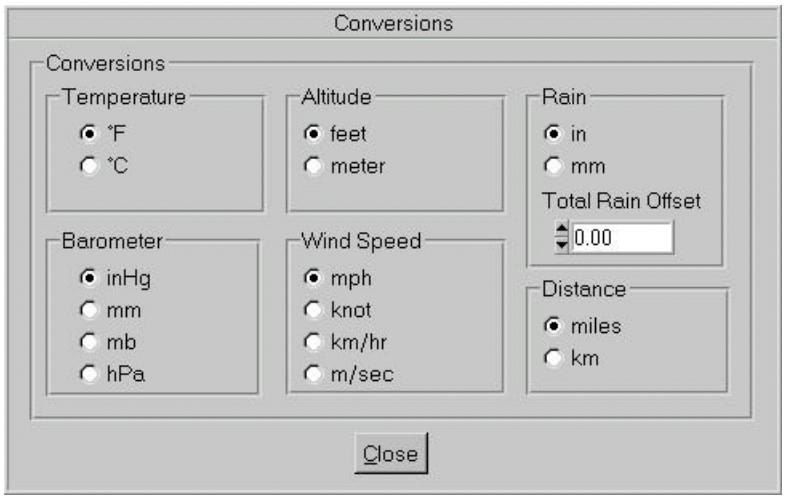


Figure 3 - Unit Conversion Settings

6.3 Calibration

Menu Shortcut: Settings ▶ Calibration

Virtual Weather Station allows you to calibrate for improved accuracy. In addition, if your wind speed sensor is below the expected reading due to bearing life, or the anemometer is obstructed by trees, these errors can be adjusted to provide realistic values.

The calibration takes the form of the following equation:

Calibrated Value = Gain x Measured Value + Offset

Reference *Table 2 - Examples of Calibration.* The table provides solutions for typical measurement problems. NOTE - changing the calibration settings in Virtual Weather Station will not adjust the parameters displayed from the console.

Problem	Solution
The wind speed is reading 50% low because the sensor is obstructed by trees. In other words, when the wind speed reads 3 mph, it is actually 6 mph.	Set the wind speed gain to 2.00.
One of my temperature sensors is off by 3 degrees	Set the temperature offset to 3.00
I installed my anemometer incorrectly, and when it points north, it should measure south	Set the wind direction offset to 180.00

Table 2 - Examples of Calibration

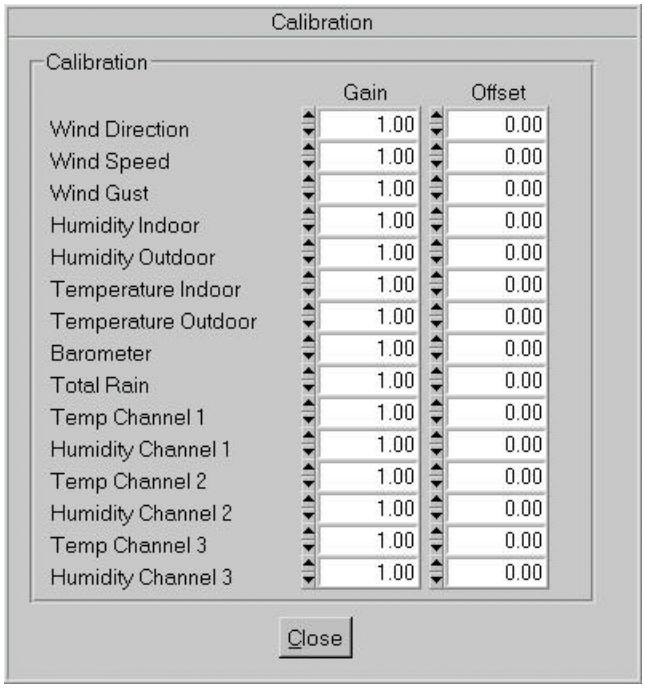


Figure 4 - Calibration

6.4 Precision

Menu Shortcut: Settings ▶ Precision

Precision is the number of decimal places. For example a precision of two would be represented as 3.14, and a precision of three would be represented as 3.141.

Virtual Weather Station allows you to customize the precision for each variable (unless otherwise noted on specific display panels). These precision values are represented in files, HTML tags and other various displays.

The precision can be changed for the values (which include averages) and rates of change. Changing the precision for the temperature will change all of the temperatures (example, indoor and outdoor).

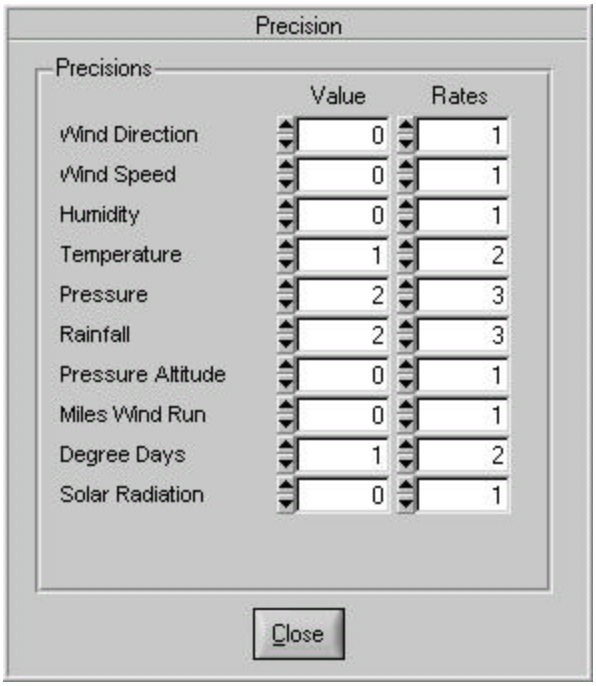


Figure 5 - Precision

6.5 Communication

- **Menu Shortcut: Communication ▶ Communication**

6.5.1 Weather Station

Select your weather station from the list. If you do not own a weather station, select the Stationless mode of operation.

6.5.2 Communication Port

Select the communication port. Refer to the chapter on *Troubleshooting Tips* for more information on selecting the correct communication port if you are unsure.

6.5.3 Baud Rate

The baudrate is adjustable for the Davis and Rainwise stations.

6.5.4 Communication Rate

Specify the communication rate that VWS communicates to the weather station. If the computer performance is poor, try increasing this timer.

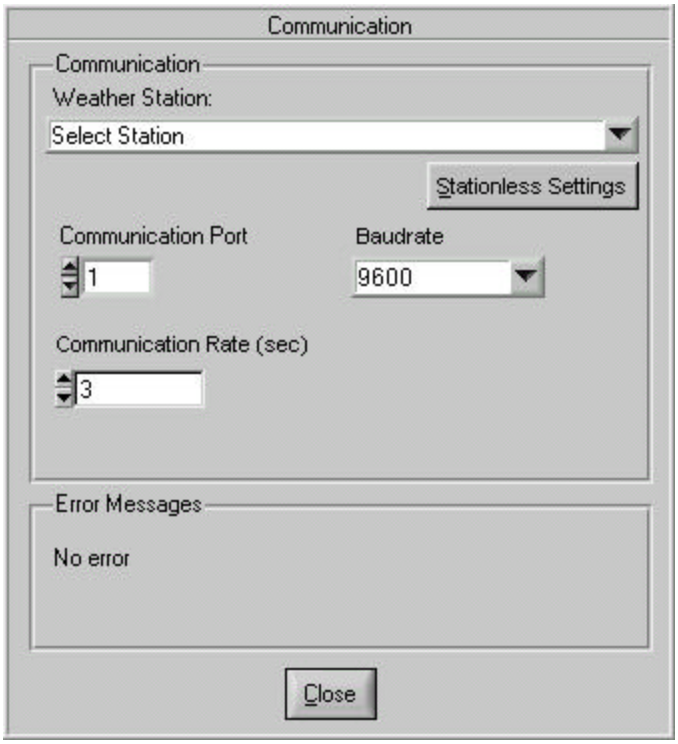


Figure 6 - Communication Settings

6.5.5 Sensor and Battery Status (WMR-918 and WMR-968 only)

- **Menu Shortcut: Communication ▶ Sensor Communication**

6.5.5.1 Communication OK

After communication with the WMR-918 or WMR-968 weather station is detected, a green LED will be displayed. After all of the remote devices have reported, this window will automatically close.

Virtual Weather Station will begin updating when all of the sensors have reported (can take up to one minute). Note that if a sensor is not reporting, it can be deactivated to continue running Virtual Weather Station.

6.5.5.2 Battery OK

A status LED will provide you with the status of the remote sensor batteries. If the LED is red, it is time to change the batteries. If the station is not reporting, the battery may be low or interference is present.

To allow Virtual Weather Station to execute without the sensor, inactivate the "problem" sensor by deselecting the Active checkbox.

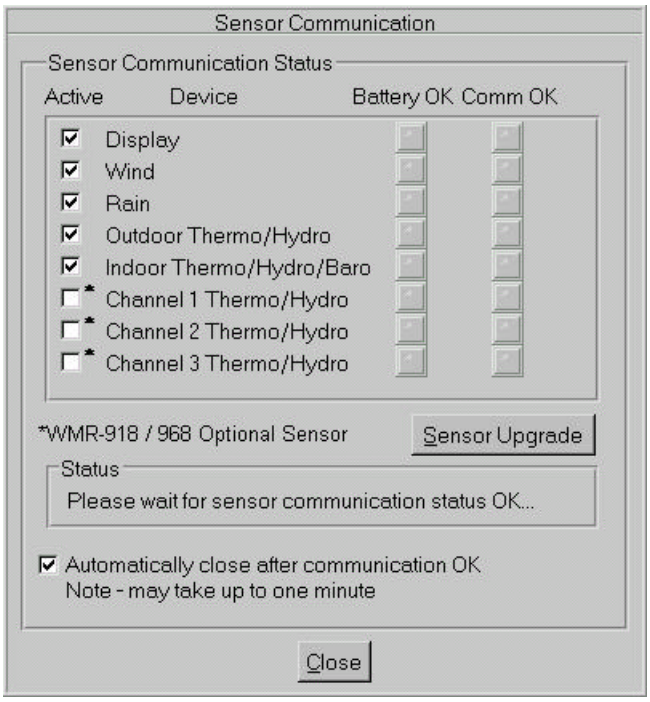


Figure 7 - Sensor Communication (WMR-918 and WMR-968 only)

6.5.6 1-Wire Stations

All 1-Wire Stations utilize PointSix's OneSix DDE Server. To download the OneSix server, please select the following link:

http://www.pointsix.com/support/software/OneSix32.exe

For more information, visit http://www.pointsix.com/cgi-bin/PointSix.cgi?Software

6.5.7 Stationless Operation

You do not even have to own a weather station to collect and display weather data, or you can view information from another computer collected on the network.

Reference Figure 8 – Stationless Mode Configuration. To operate in the Stationless mode, select the Stationless Weather Station option, and then the **Stationless Settings** button.

In the Stationless mode, the input is based on a comma separated file (csv) data generated by Virtual Weather Station running on a different computer across the network, from data downloaded from a METAR weather site, or data input from a third party program.

The format of the comma separated file data is described in Section 6.26.

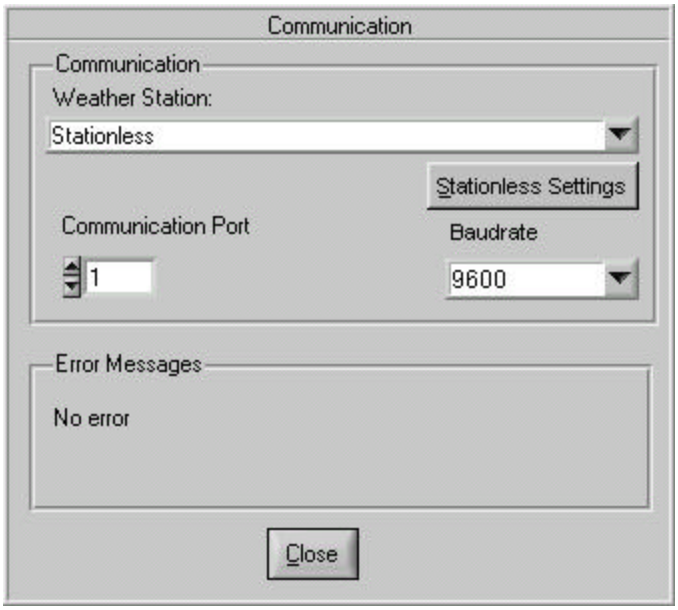


Figure 8 – Stationless Mode Configuration

6.5.7.1 Connecting to a Computer Across the Network

With Virtual Weather Station connected to your weather station on your local area network, you can launch Virtual Weather Station from any computer on the network and view this data real-time. The "host" computer (connected to the weather station) generates a comma separated file that is read by the "remote" computer. The following steps are required.

1. From the host computer, select the option to generate a comma separated file (reference Section 6.26).

2. Reference Figure 9 – Stationless Operation. From the remote computer, browse to the data.csv file generated by the host computer as described in Section 6.26.

3. From the remote computer, select the Run VWS Remote checkbox and browse to the location where VWS is installed on the host computer.

4. The program will automatically quit, and must be restarted.

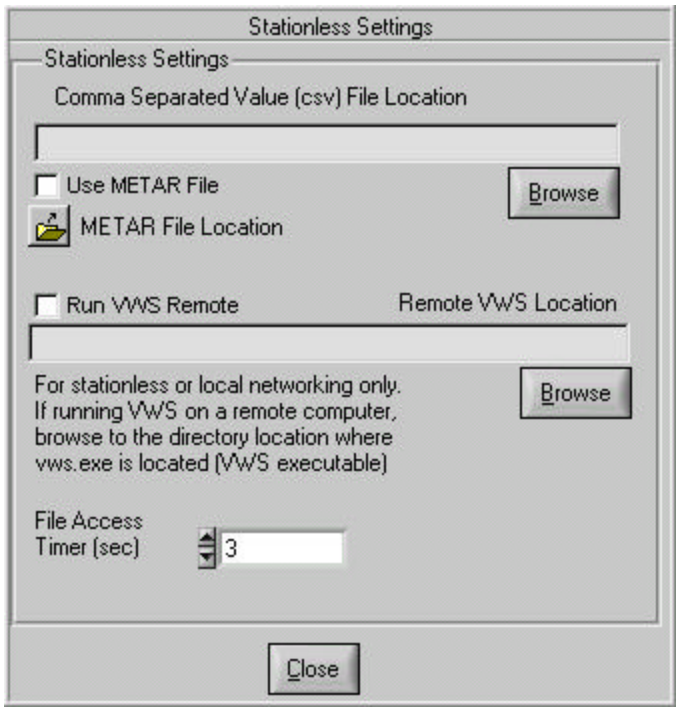


Figure 9 – Stationless Operation

6.5.7.2 Displaying METAR Data in the Stationless Mode

Virtual Weather Station can be configured to gather data from a METAR station, and display this data. VWS creates a csv file from the METAR data. To specify the METAR data, select the Use METAR file checkbox and select the METAR File Location button to browse to the csv file location.

6.5.7.3 File Timer Access

Set the file timer access to the rate at which the host computer updates the csv file. For example, METAR data updates may occur once per hour. Continuous file access, particularly across a network will degrade the performance of the remote computer.

6.6 General Program Settings

Menu Shortcut: Settings ▶ Program Settings

6.6.1 Start Program Hidden

The program can be set to start hidden when the computer starts. To view the hidden program, double click on the icon in the taskbar.

6.6.2 Reboot Schedule

For remote monitoring applications, it is sometimes advantageous to automatically reboot periodically to keep the program resources fresh.

6.6.3 CPU Resources

You can adjust the CPU resources VWS uses to run. The high setting will increase the performance of VWS but may decrease the performance of other programs. The low setting will decrease the performance of VWS but increase the performance of other programs.

If VWS "locks up", this may be due to a lack of resources. Try increasing the CPU resources.

Figure 10 – General Program Settings

6.7 Station Settings

- **Menu Shortcut: Settings ▶ Station Settings, Sun, Moon and Altitude**

Station settings are required to calculate your sunrise, sunset, moonrise and moonset, and the barometric pressure corrected to sea-level.

6.7.1 Longitude and Latitude

To calculate the sunrise, sunset, moonrise and moonset for your location, the longitude, latitude, and time zone is required. If the sunrise and sunset appear incorrect, see *Troubleshooting Tips*.

There are several sources for determining the longitude and latitude for your location. The best source is the Internet. Another source may be your local town hall.

Map Blast provides this information at the following link:

www.mapblast.com

To convert the decimal notation to degree notation, select the longitude and latitude link after the decimal notation is displayed.

6.7.2 Time Zone

The time zone is required for calculating the sunrise, sunset, moonrise and moonset. If you live in a time zone that does not adhere to the GMT standard and is offset by 30 minutes, enter the offset in the +Time Zone Offset (min) numerical field.

If the daylight savings time is not calculated properly by your Windows operating system, you can compensate by adding or subtracting 60 minutes.

The celestial calculator is a close approximation of the sunrise and sunset in your location and may be inaccurate by several minutes due to equation inaccuracy or your altitude (the equations are based on sea-level).

6.7.3 Altitude

An air data calculator is included in Virtual Weather Station. Virtual Weather Station uses the same formulas used in airplane data computers flying throughout the world. The altitude and air data information provides air density, pressure altitude, corrected temperature and pressure to sea-level conditions.

6.7.4 Air Data Calculator (correcting Pressure to Sea-level Conditions)

To compare pressure conditions from one location to another, meteorologists correct pressure to sea-level conditions. Because the air pressure decreases as you rise in altitude, the sea-level corrected pressure (the pressure your location would be at if located at sea-level) is generally higher than your measured pressure. Thus, your pressure may read 28.62 inHg (969 mb) at an altitude of 1000 feet (305 m), but the corrected pressure is 30.00 inHg (1016 mb).

The standard sea-level pressure is 29.92 in Hg (1013 mb). Pressure conditions greater than 29.92 inHg (1013 mb) are considered high pressure and less than are considered low pressure.

Most weather stations instruct you to find a reporting station near your location to identify the corrected pressure, but Virtual Weather Station calculates this offset for you.

To calculate this offset:

- Enter your altitude
- Virtual Weather Station displays your bias with respect to sea-level.
- Enter this bias in your weather station (see the weather station instruction manual for details).

Sea-level temperature is important to racing enthusiasts and engineers for calculating

performance characteristics.

6.7.5 Celestial Calendar

Virtual Weather Station includes a celestial calendar for calculating sunrise, sunset, moonrise and moonset times. You can calculate these times for any calendar date.

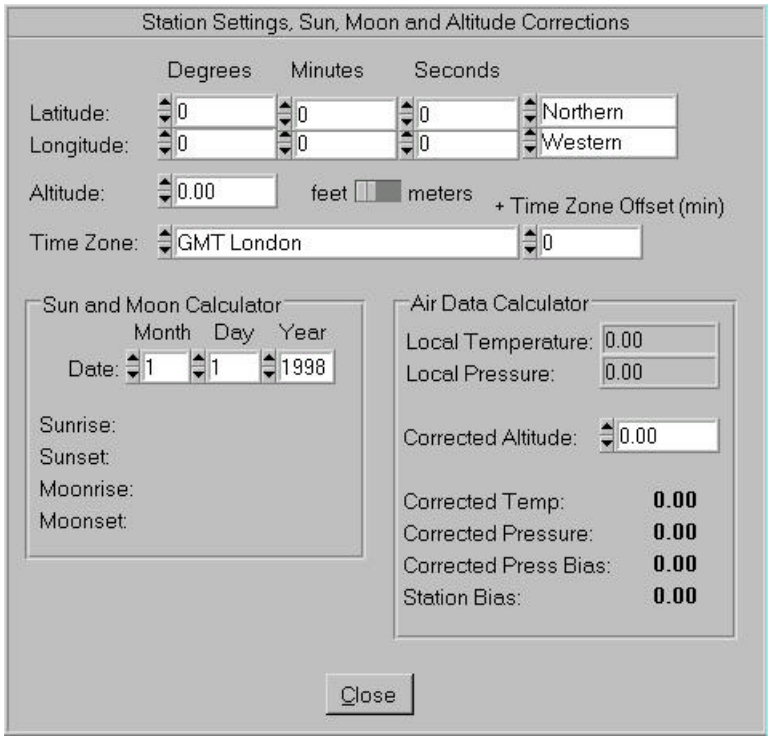


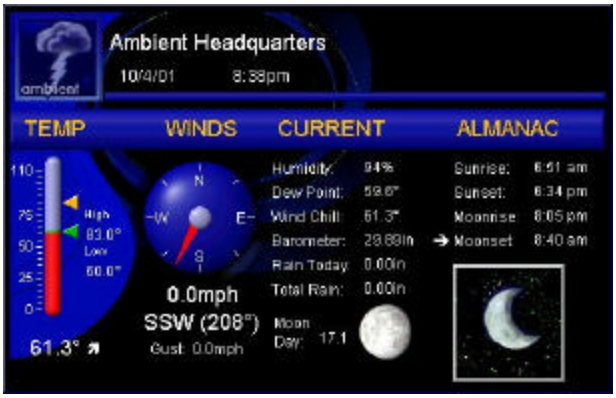
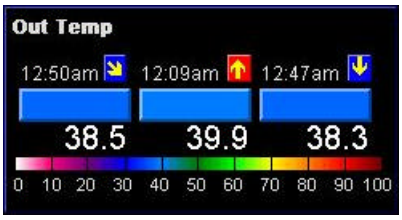
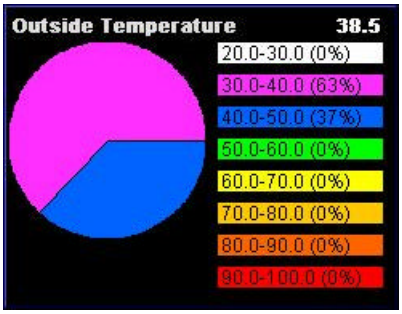
Figure 11 - Station Settings (Location and Altitude)

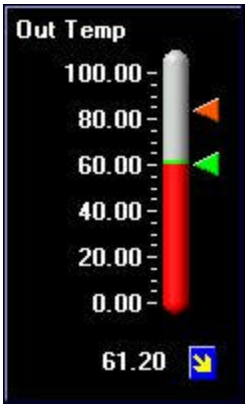
6.8 Real-time Data

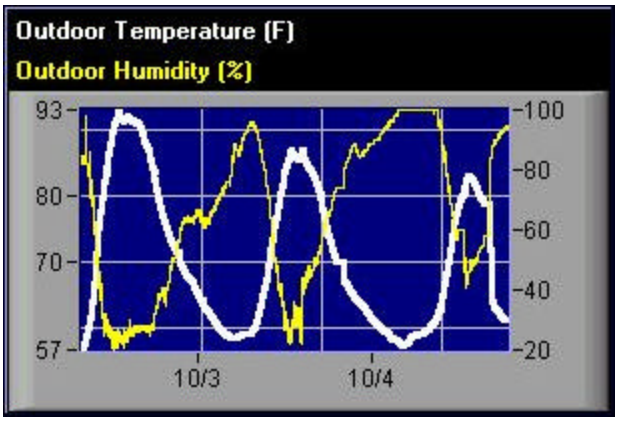
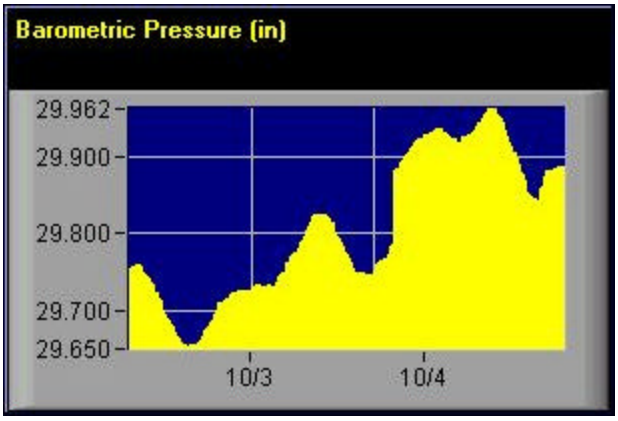
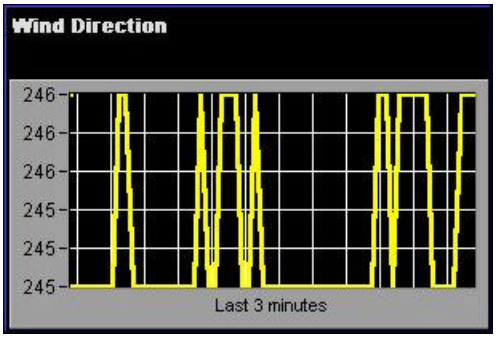
Virtual Weather Station continuously collects data from your weather station. The sample rate varies based on your weather station's specifications. See your weather station user manual for specifics on the sample rate.

6.9 Weather Displays

Table 3 provides a list of the weather displays and a description of each display.

Description	Display
6.9.1 Icon (WM-918, WMR-918 and WMR-968 only) Weather conditions based on weather station prediction. Switches from day to night based on sunrise and sunset times.	
6.9.2 Broadcast TV broadcast display. Logo and location name can be modified by selecting right-mouse click on display.	
6.9.3 Color Spectrum Color bars change color based on adjustable color spectrum. Displays daily high, low and current value. Rate of change arrow represents rising, falling or steady.	
6.9.4 High / Low Display Simple daily high and low display. Displays daily high, low and current value. Rate of change arrow represents rising, falling or steady.	
6.9.5 Distribution Chart Pie chart displays historical distribution. Range values are adjustable. Note - the chart will be empty if (1) the database is empty (example, when the program is first started, or (2) Data has not been collected in the plot time frame specified in the attributes window (the program was off).	

Description	Display
6.9.6 Wind Direction Displays current wind direction. Display fills clockwise from the North.	
6.9.7 Thermometer Thermometer gauge with rate of change arrow and high / low pointers.	
6.9.8 Gauge Rotary gauge with rate of change arrow. If the maximum limit of the gauge is exceeded, the gauge displays a red alarm box.	

Description	Display
6.9.9 Meter Meter gauge with rate of change arrow. If the maximum limit of the gauge is exceeded, the gauge displays a red alarm box.	
6.9.10 Graph Plot one or two parameters vs. time. Data is based on database, and can be plotted over several hours or days. Provides an array of graphical styles and options, such as line style and auto scaling. Note - the graph will be empty if (1) the database is empty (example, when the program is first started, or (2) Data has not been collected in the plot time frame specified in the attributes window (the program was off)..	 
6.9.11 Strip Chart Provides rapid real-time data (data is not stored). Intended for viewing data over minutes to view rapid trends (example, wind speed and wind direction). The strip chart does not store historical data, and will start over each time the program is	

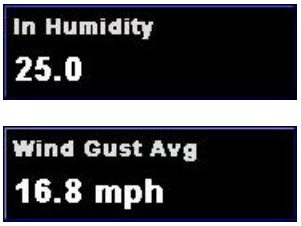
Description	Display
launched.	
6.9.12 Tank Colorful display fills based on color spectrum. Includes high and low pointers and rate of change arrow.	
6.9.13 Alpha Numeric Simple alphanumeric display.	
6.9.14 Moon Phase Current Moon phase or moon day.	

Table 3 - Weather Displays

6.9.15 Difference Between Graphs and Strip Charts

The graphs and strip charts serve two very different purposes. Table 4 - Graphs vs. Strip Charts outlines the differences:

Feature	Graph	Strip Chart
Plot long term trends, such as temperature, pressure and humidity over several days and weeks.	✓	
Plot short term plots, such as wind speed and direction, over minutes or hours		✓
Uses stored data (database) for plotting	✓	

Feature	Graph	Strip Chart
Loses data after program is restarted		✓

Table 4 - Graphs vs. Strip Charts

6.10 Customizing Displays

6.11 Adding and Deleting Displays

- **Menu Shortcut: Modify Display ▶ Icon, Broadcast, Color Spectrum, High / Low Display, Wind Direction, Distribution, Thermometer, Gauge, Meter, Graph, Strip Chart, Ribbon, Alpha Numeric, Moon Phase**

The desktop can be completely customized, including size and location of the displays. You can choose hundreds of different display combinations.

Select the display type and parameter from the menu bar, and the display will be added to (or deleted from) the desktop.

Right-mouse-click on the display to modify the individual display attributes.

Note that some of the check boxes will be dimmed depending on the display. For example, the Forecast can not be displayed from the graphs or strip charts because it is not saved in the database. All parameters can be viewed using the alphanumeric display.

NOTE - Sensor options vary from station to station. Check your Weather Station user's manual for the complete list of weather parameters.

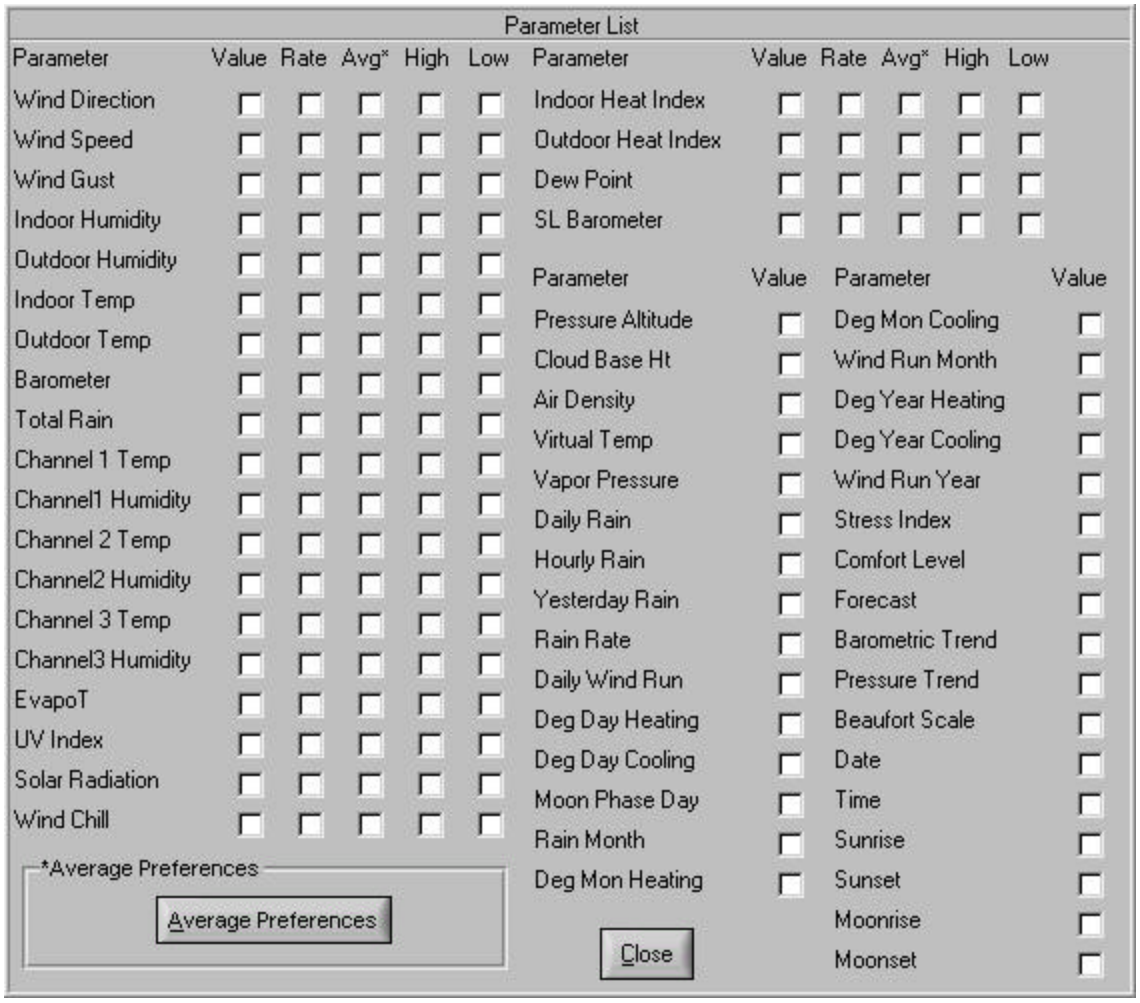


Figure 12 - Add / Delete Displays with Parameter List

6.11.1 Modifying the Display and Display Attributes

{Right-mouse-click on any weather display}

To modify any of the displays, right-mouse-click on the display. The following display attributes are adjustable:

Attribute	Description
Display Title	Display Title can be modified for each display
Display Title 2	Only valid for graphs and strip charts. Displays second graph title.

Attribute	Description
Title Color	Changes the title color.
Title Color 2	Only valid for graphs and strip charts. Changes the title 2 color.
Lower Limit	Lower display numerical limit.
Upper Limit	Upper display numerical limit.
Precision	Numbers left of the decimal point. For example, a precision of zero is 76, a precision of 2 is 76.03.
Background Color	The display background color.
Number Color	The number color for all of the numbers in the display
Frame Color	Weather display frame color
Needle Color	Needle color for meter and rotary gauge
Fill Color	Fill color for gages and graphs
Frame Width	The width of the frame
Scale	Adjusts weather display size. If the scale is 100%, changing the display size from the desktop will not resize the contents. If the scale is not 100%, changing the size from the desktop will resize contents.
Autoscale Plot	Auto scale y-axis on graphs and charts
Plot Previous x hours (or minutes)	Plots previous number of hours for graphs and minutes for strip charts,. If unchecked, graphs all of the data in your database.
Plot Style	Customize different plotting styles for graphs and strip charts (thin line, fat line, vertical fill, step)
Add second plot	Adds a second plot to the graph or strip chart.
Plot Color	Specify plot color for both plots
Grid Color	Specify grid color
Jpeg Filename	Each graphical element has a specific jpeg filename when this option is activated. Provides a reference for each specific jpeg

Attribute	Description
	filename. For more information on jpeg files, *reference Jpeg Files.*
X and Y Gridlines	Change the number of gridlines displayed on graphs and strip charts.

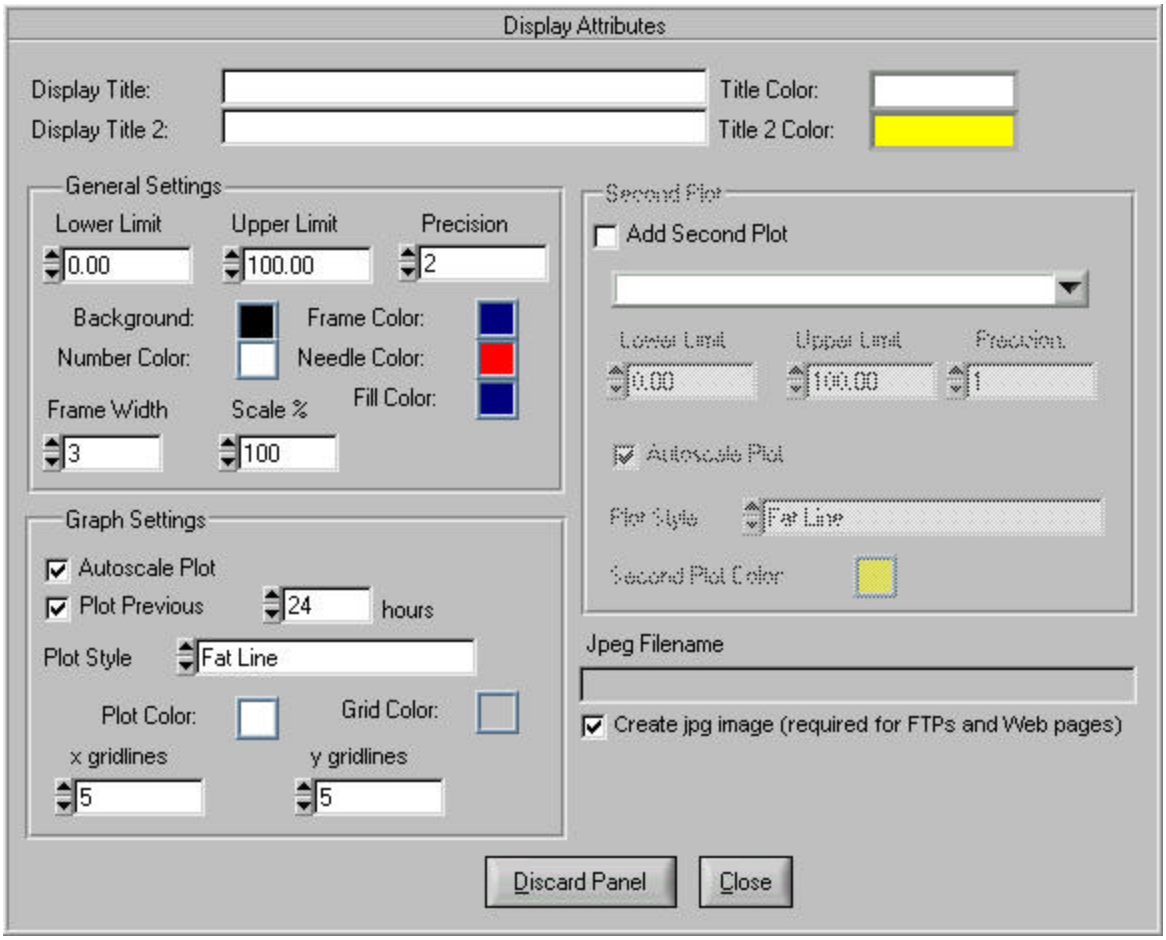


Figure 13 - Display Attributes

6.11.2 Broadcast Display Settings

Menu Shortcut: Modify Display ▶ Broadcast Display

The broadcast display can be customized with your own logo image and title. To view the broadcast display settings, right-mouse-click on the broadcast panel.

6.11.2.1 Displaying the Icon

The icon can be displayed on the Broadcast display. To specify the method for updating the icon, select the Icon Settings Button.

6.11.2.2 Changing the Background Image

A custom image can be displayed in the broadcast display.

6.11.2.3 Changing the Logo Image

The default logo image is for Ambient. This can be customized to include your own personal logo.

6.11.2.4 Web Cams, Weather Cams and Dynamic Images

WebCams or WeatherCams can be displayed in the broadcast panel. To display a WeatherCam image, a software package such as WebCam32 or ISpy is required to generate jpeg images. The images are then imported into Virtual Weather Station by defining the path to where the files are located. The images can be viewed as a still frame or a time lapse, providing a summary of weather over the course of the day.

6.11.2.4.1 Displaying the WeatherCam Image in the Broadcast Panel

To display the WeatherCam image in the Broadcast panel, launch WeatherCam32 or ISpy and begin automatically generating the jpg image. Once this image is created and automatically updated, browse to the location on your hard drive by selecting the Browse button in the Broadcast Panel.

6.11.2.4.2 Sizing the Image

The image can be sized to fit inside the control, or the control can be resized to fit the image size. Select the Size Control to Image pull down menu.

6.11.2.4.3 Image Time Stamp

To display the last update time of the WeatherCam image, select the Image Time Stamp checkbox.

6.11.2.4.4 Daytime Update Only

Since nighttime WeatherCam images can be uneventful, select this checkbox to stop updating the WeatherCam image at night.

6.11.2.4.5 Time Lapse

A time lapse of the WeatherCam image can be displayed. Select the Time Lapse checkbox, the

lapse rate and the number of images in the time lapse. Note that the time lapse feature can only be viewed on the computer and not over the Internet.

6.11.2.4.6 Reset Display at Midnight

Memory leaks may occur with some operating systems when updating images. To reset memory at midnight, select the checkbox and the panel will be discarded and reloaded.

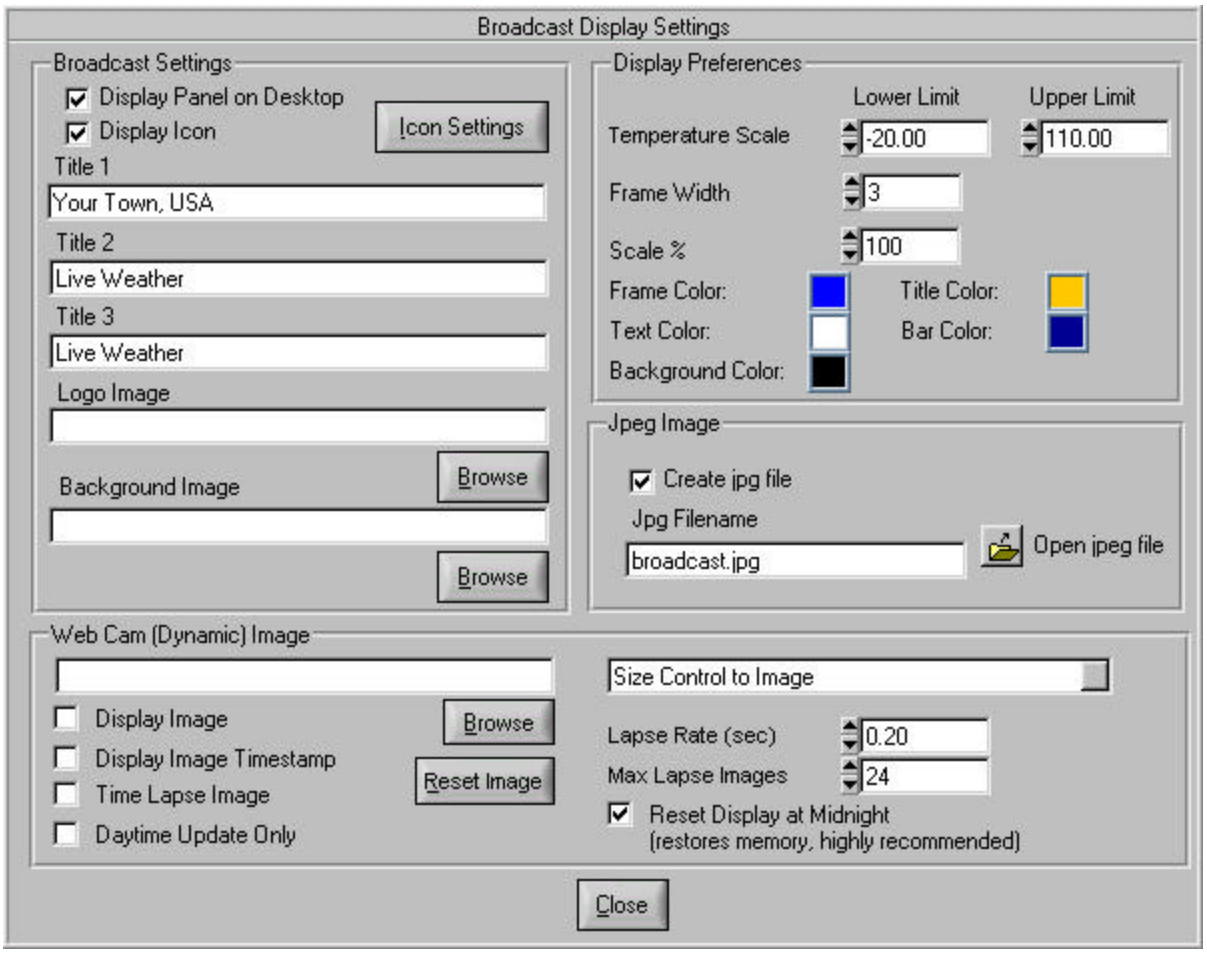


Figure 14 - Broadcast Display Attributes

6.12 General Display Settings

- **Menu Shortcut: Modify Display ▶ General Display Settings**

General display settings change all of the display settings at the same time. Reference Table 5 - General Display Settings.

Display Setting	Description
Time and Date Display	Specify date and 24-hour vs. 12 hour format
Background Color	Specify the display panel background color
Font Settings	Changes the font setting for all of the displays.
Display Colors	Changes all of the display colors at the same time.
Language Preference	Virtual Weather Station provides limited foreign language support. To change the titles to the language of choice, edit each individual display.
Scroll Display	Ideal for monitoring the display on a television or closed circuit. You can display weather images on the entire desktop and automatically scroll.
Snap to Grid Pixels	Specify the grid resolution for aligning the weather display images.
Average Display Preferences	Allows you to chose between a one hour filtered average, the daily average, the monthly average or the yearly average on the display.

Table 5 - General Display Settings

6.12.1 Full Screen Display

To use the full screen display, double click anywhere on the background of the desktop (other than a weather element). To return to the normal display, hit any key.

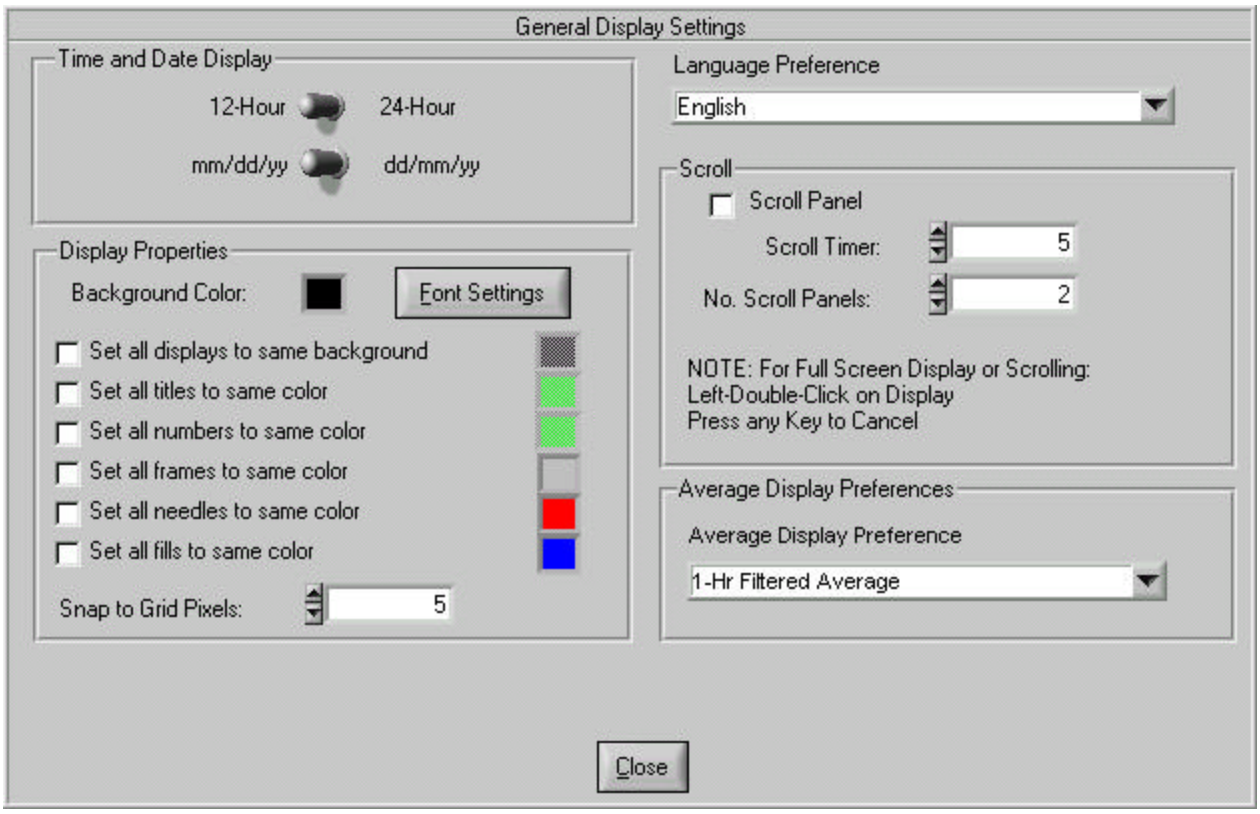


Figure 15 - General Display Settings

6.13 Database

Menu Shortcut: Settings ▶ Database Settings

Virtual Weather Station generates a database for storing data for plotting and graphing. This data is stored in a comma separated file located in the following directory path:

\VWS\data\dbase.csv

where csv stands for "comma separated value". This database can be viewed, edited and deleted.

6.13.1 Database Timer

A database timer allows you to customize how often data is written to the database. The database is limited to 20,000 records, so the recommended minimum database timer is 10 minutes.

Once the database reaches 20,000 records, is automatically resized to 15,000 records. A backup record of the database is stored in the following file:

\VWS\data\yyyydbase.csv

where yyyy is the current year.

If the database is damaged or deleted, simply rename the backup database.

6.13.2 Database Format

The database format is outlined in Table 6 – Database Format.

Column Number	Parameter
1	Date, with the following format: YyyyMonthDayHourMinute
2	Wind Direction (degrees)
3	Wind Speed (mph)
4	Wind Gust (mph)
5	Indoor Humidity (%)
6	Outdoor Humidity (%)
7	Indoor Temperature (°F)
8	Outdoor Temperature (°F)
9	Barometric Pressure (in)
10	Total Rain (in)
11	Channel 1 Temperature (°F)
12	Channel 1 Humidity (%)
13	Channel 2 Temperature (°F)
14	Channel 2 Humidity (%)
15	Channel 3 Temperature (°F)
16	Channel 3 Humidity (%)
17	Evapotranspiration
18	UV Index
19	Solar Radiation (W/sqm)
20	Wind Chill (°F)
21	Indoor Heat Index (°F)
22	Outdoor Heat Index (°F)
23	Dew Point (°F)
24	Sea-level Barometric Pressure

Table 6 – Database Format

6.13.3 Editing and Deleting Database Records

You can recall and edit any of the database records by date or record number. Once you retrieve a database record, the data can be edited to correct errors.

6.13.4 Resizing the Database

To resize the database, select the Resize Database number. Decreasing the database size can improve the operating speed of Virtual Weather Station.

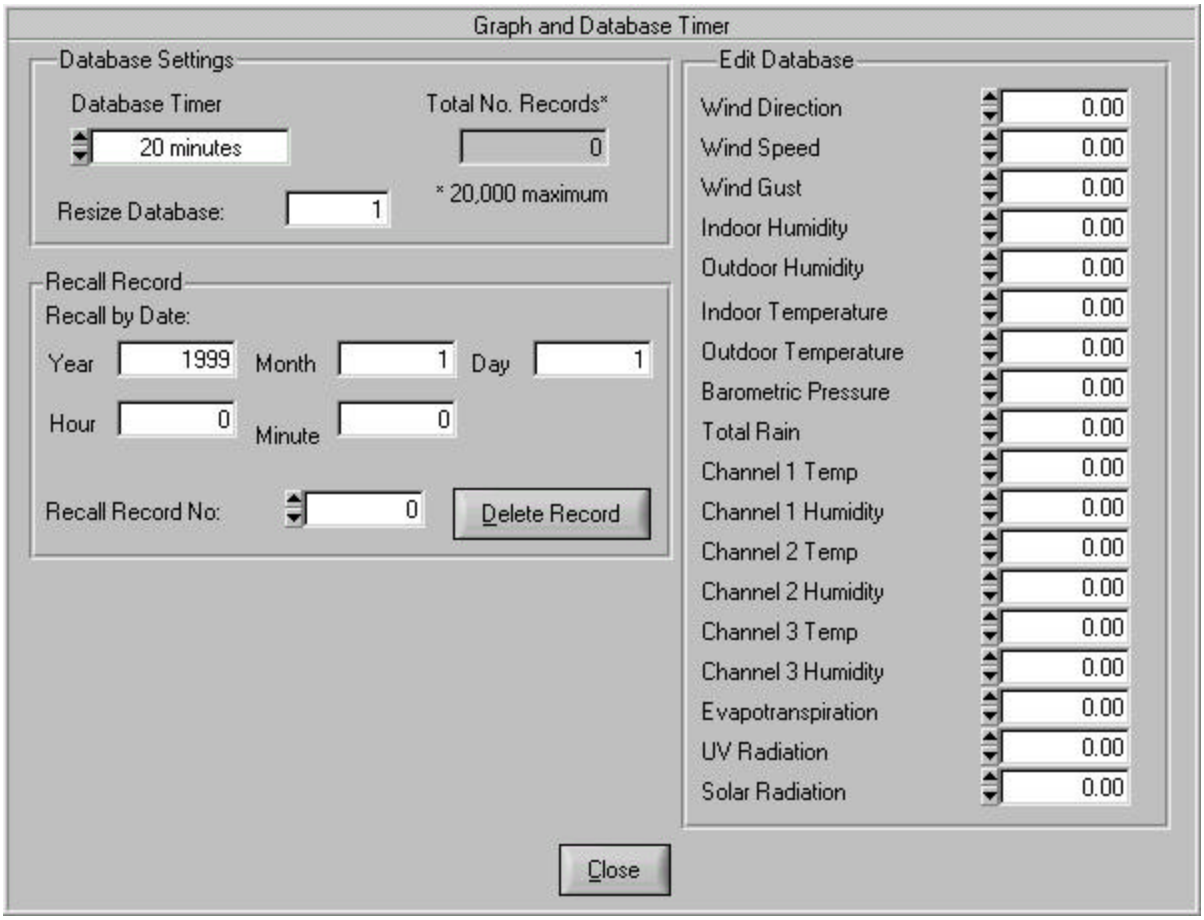


Figure 16 - Database Settings

6.14 Jpeg Files

Menu Shortcut: Settings ▶ Jpeg File Settings

Jpeg is a standard image format for web pages. Virtual Weather Station periodically creates jpeg images for inclusion in your web page, providing real time weather conditions which can be viewed from a web browser.

You can only generate jpeg images for weather displays currently on your desktop.

6.14.1 Image Quality

You can adjust the image quality of the jpeg image. Increasing the quality increases the file size. In general, the image quality is the same for 80 - 100%. The recommended quality is 80%.

6.14.2 Jpeg File Location

Specifies where the jpeg files are saved. For web server applications, save in the web server root directory.

6.14.3 Jpeg File Naming Convention

To view the filename for the jpeg image, right-mouse-click on the weather display and the jpeg filename will be displayed.

For example, the jpeg filename for the Outdoor Temperature Spectrum is wc007.jpg

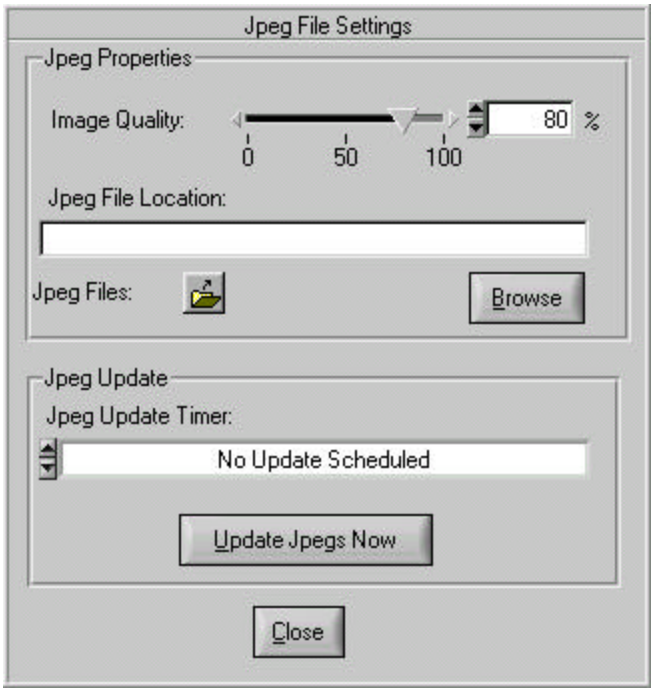


Figure 17 - Jpeg File Settings

6.15 Advanced Parameter Settings

Menu Shortcut: Settings ▶ Advanced Parameter Settings

Virtual Weather Station provides the following advanced parameter settings.

6.15.1 Degree Days Heating and Cooling

Because temperature plays an important part in the rate of development of plants and many pests, a measurement which takes into account the accumulation of heat with passing time is important to predict maturation. Degree-days provide a measure for calculating the effects of temperature on the development of plants or pests.

One degree-day is the amount of heat which accumulates when the temperature remains one degree above the threshold for one day. One degree day is also the amount of heat which accumulates when the temperature is 24 degrees above the threshold for one hour.

6.15.1.1 Heating Threshold

The threshold for calculating degree-days heating.

6.15.1.2 Cooling Threshold

The threshold for calculating degree-days cooling.

6.15.2 Wind Run

Wind run is the distance wind has traveled. For example, the wind run for a constant wind speed of 20 mph for 2 hours is 40 miles, or:

Wind Run = Wind Speed * Time

6.15.3 Pressure Trend

Your station may not calculate the pressure trend. Virtual Weather Station will calculate the pressure trend based on your own specified threshold. If the rate of change of pressure is above this threshold, Virtual Weather Station will report rising pressure. If the rate of change of pressure is below this threshold, Virtual Weather Station will report falling pressure.

6.15.4 Setting Daily and Monthly Rain

You can reset the daily and monthly rain. Note the Davis daily and monthly rain must be set directly from the console.

6.15.5 Wind Gust Calculation

Each weather station uses a different method for calculating wind gust. You can override your station’s default method and select the maximum within a specified number of samples.

6.15.6 Filtered Average Time Constant

The time constant for the filtered average can be varied. The filter is based on a low pass filter differential equation. The output value reaches 63% of the input value after one time constant (the default time constant is 60 minutes or one hour), and will reach 95% of the input value after five time constants (default = 300 minutes or five hours).

6.15.7 New Wind Chill Calculation

On November 1, 2001, the National Weather Service (NWS) implemented a replacement Wind Chill Temperature (WCT) index for the 2001/2002 winter season. The reason for the change was to improve upon the current WCT Index used by the NWS and the Meteorological Services of Canada (MSC, the Canadian equivalent of the NWS), which was based on the 1945 Siple and Passel Index.

The new formula made use of advances in science, technology, and computer modeling to provide a more accurate, understandable, and useful for calculating the dangers from winter winds and freezing temperatures. In addition, clinical trials have been conducted and the results of those trials have been used to verify and improve the accuracy of the new formula.

Standardization of the WCT Index among the meteorological community is important, so that an accurate and consistent measure is provided and public safety is ensured. Our goal was to implement the new wind chill formula in Canada and the United States during the same time frame in order to have a consistent WCT Index for North America.

Specifically, the new WCT index will:

- use calculated wind speed at an average height of five feet (typical height of an adult human face) based on readings from the national standard height of 33 feet (typical height of an anemometer);
- be based on a human face model;
- incorporate modern heat transfer theory (heat loss from the body to its surroundings, during cold and breezy/windy days);
- lower the calm wind threshold to 3 mph;
- use a consistent standard for skin tissue resistance; and
- assume no impact from the sun (i.e. clear night sky).

Virtual Weather Station allows you to use the old or new wind chill models. For more information, please reference the National Weather Service:

http://205.156.54.206/om/windchill/index.shtml

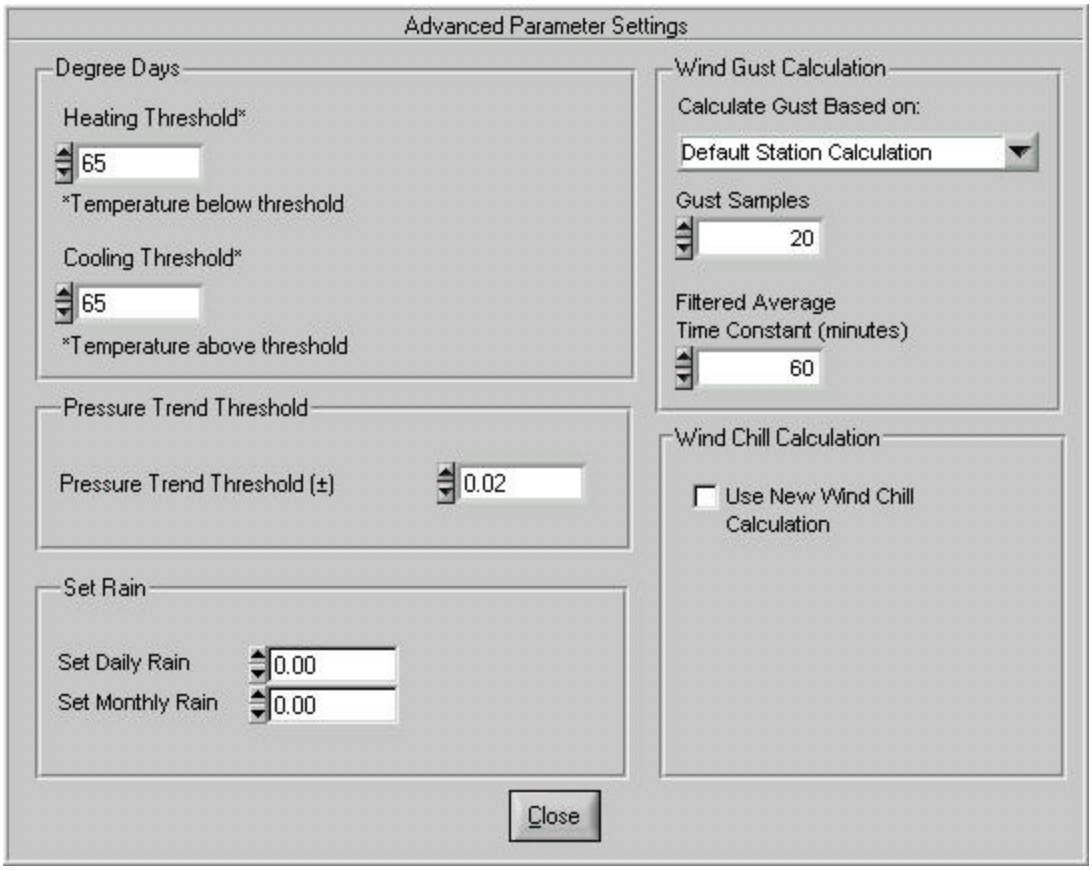


Figure 18- Advanced Parameter Settings

6.15.8 Resetting Daily Minimum and Maximum Values

Menu Shortcut: Settings ▶ Reset Min and Max

You can reset the daily minimums and maximums at any time by selecting the **OK** button.

Figure 19 - Resetting Minimums and Maximums

6.16 Complete Parameter List

Menu Shortcut: Window ▶ Complete Parameter List

Table 7 provides a complete list of the parameters (1) measured by your weather station, (2) calculated by your weather station and retrieved by Virtual Weather Station, or (3) calculated by Virtual Weather Station.

6.16.1 Daily Highs and Lows

Daily highs and lows are calculated by Virtual Weather Station. Note that Virtual Weather Station must be running for the daily highs and lows to be recorded.

6.16.2 Average Values

Average values for all of the weather parameters are calculated by Virtual Weather Station based on a one hour time period. Like the daily highs and lows, Virtual Weather Station must be running for the daily highs and lows to be recorded (average values are not stored in the weather station).

When Virtual Weather Station is restarted, the average values are reset to the current value.

6.17 Rate of Change Values

Rate of change values for all of the weather parameters are calculated by Virtual Weather Station based on a one hour time period. Like the daily highs and lows, Virtual Weather Station must be running for rate of change values to be recorded.

When Virtual Weather Station is restarted, the rate of change values are reset to zero.

NOTE - Available sensors vary based on your weather station. See your weather station manual for more details.

No.	Parameter Name	Measured by Station	Calculated by Station	Calculated by VWS
1	Wind Direction	✓		
2	Wind Speed[1]	✓		
3	Wind Gust[2]	✓	or	✓
4	Indoor Humidity	✓		

[1] Wind Speed is displayed as wind gust on the weather station. See Section 6.8, Real-time Data for more details.

[2] Wind Gust is calculated from the wind gust displayed on the weather station. See Section 6.8, Real-time Data for more details.

No.	Parameter Name	Measured by Station	Calculated by Station	Calculated by VWS
5	Outdoor Humidity	✓		
6	Indoor Temperature	✓		
7	Outdoor Temperature	✓		
8	Barometric Pressure	✓		
9	Total Rain	✓		
10	Channel 1 Temperature[3]	✓		
11	Channel 1 Humidity[3]	✓		
12	Channel 2 Temperature[3]	✓		
13	Channel 2 Humidity[3]	✓		
14	Channel 3 Temperature[3]	✓		
15	Channel 3 Humidity[3]	✓		
16	Evapotranspiration[4]	✓		
17	UV Index[4]	✓		
18	Solar Radiation[4]	✓		
19	Wind Chill			✓
20	Indoor Heat Index			✓
21	Outdoor Heat Index			✓
22	Dew Point			✓
23	Sea-level Barometric Pressure			✓
24	Pressure Altitude			✓
25	Cloud Base Height			✓

[3] Optional Sensor

[4] Davis Instruments only

No.	Parameter Name	Measured by Station	Calculated by Station	Calculated by VWS
26	Air Density			✓
27	Virtual Temperature			✓
28	Vapor Pressure			✓
29	Wind Direction Rate			✓
30	Wind Speed Rate			✓
31	Wind Gust Rate			✓
32	Indoor Humidity Rate			✓
33	Outdoor Humidity Rate			✓
34	Indoor Temperature Rate			✓
35	Outdoor Temperature Rate			✓
36	Barometric Pressure Rate			✓
37	Total Rain Rate			✓
38	Channel 1 Temperature Rate[3]			✓
39	Channel 1 Humidity Rate[3]			✓
40	Channel 2 Temperature Rate[3]			✓
41	Channel 2 Humidity Rate[3]			✓
42	Channel 3 Temperature Rate[3]			✓
43	Channel 3 Humidity Rate[3]			✓
44	Evapotranspiration Rate[4]			✓
45	UV Index Rate[4]			✓
46	Solar Radiation Rate[4]			✓
47	Wind Chill Rate			✓
48	Indoor Heat Index Rate			✓

No.	Parameter Name	Measured by Station	Calculated by Station	Calculated by VWS
49	Outdoor Heat Index Rate			✓
50	Dew Point Rate			✓
51	Sea-level Barometer Rate			✓
52	Wind Direction Avg.			✓
53	Wind Speed Avg.			✓
54	Wind Gust Avg.			✓
55	Indoor Humidity Avg.			✓
56	Outdoor Humidity Avg.			✓
57	Indoor Temperature Avg.			✓
58	Outdoor Temperature Avg.			✓
59	Barometric Pressure Avg.			✓
60	Total Rain Avg.			✓
61	Channel 1 Temperature Avg.[3]			✓
62	Channel 1 Humidity Avg.[3]			✓
63	Channel 2 Temperature Avg.[3]			✓
64	Channel 2 Humidity Avg.[3]			✓
65	Channel 3 Temperature Avg.[3]			✓
66	Channel 3 Humidity Avg.[3]			✓
67	Evapotranspiration Avg[4]			✓
68	UV Index Avg[4]			✓
69	Solar Radiation Avg[4]			✓
70	Wind Chill Avg.			✓
71	Indoor Heat Index Avg.			✓

No.	Parameter Name	Measured by Station	Calculated by Station	Calculated by VWS
72	Outdoor Heat Index Avg.			✓
73	Dew Point Avg.			✓
74	Sea-level Barometer Avg.			✓
75	Wind Direction Daily High			✓
76	Wind Speed Daily High			✓
77	Wind Gust Daily High			✓
78	Indoor Humidity Daily High			✓
79	Outdoor Humidity Daily High			✓
80	Indoor Temperature Daily High			✓
81	Outdoor Temperature Daily High			✓
82	Barometric Pressure Daily High			✓
83	Total Rain Daily High			✓
84	Channel 1 Temperature High[3]			✓
85	Channel 1 Humidity High[3]			✓
86	Channel 2 Temperature High[3]			✓
87	Channel 2 Humidity High[3]			✓
88	Channel 3 Temperature High[3]			✓
89	Channel 3 Humidity High[3]			✓
90	Evapotranspiration High[4]			✓
91	UV Index High[4]			✓
92	Solar Radiation High[4]			✓
93	Wind Chill Daily High			✓
94	Indoor Heat Index Daily High			✓

No.	Parameter Name	Measured by Station	Calculated by Station	Calculated by VWS
95	Outdoor Heat Index Daily High			✓
96	Dew Point Daily High			✓
97	Sea-level Barometer High			✓
98	Wind Direction Daily Low			✓
99	Wind Speed Daily Low			✓
100	Wind Gust Daily Low			✓
101	Indoor Humidity Daily Low			✓
102	Outdoor Humidity Daily Low			✓
103	Indoor Temperature Daily Low			✓
104	Outdoor Temperature Daily Low			✓
105	Barometric Pressure Daily Low			✓
106	Total Rain Daily Low			✓
107	Channel 1 Temperature Low[3]			✓
108	Channel 1 Humidity Low[3]			✓
109	Channel 2 Temperature Low[3]			✓
110	Channel 2 Humidity Low[3]			✓
111	Channel 3 Temperature Low[3]			✓
112	Channel 3 Humidity Low[3]			✓
113	Evapotranspiration Low			✓
114	UV Index Low			✓
115	Solar Radiation Low			✓
116	Wind Chill Daily Low			✓
117	Indoor Heat Index Daily Low			✓

No.	Parameter Name	Measured by Station	Calculated by Station	Calculated by VWS
118	Outdoor Heat Index Daily Low			✓
119	Dew Point Daily Low			✓
120	Sea-level Barometer Low			✓
121	Daily Rain			✓
122	Hourly Rain			✓
123	Yesterday Rain		✓	
124	Rain Rate		✓	
125	Daily Wind Run			✓
126	Daily Degree Days Heating			✓
127	Daily Degree Days Cooling			✓
128	Moon Phase			✓
129	Monthly Rain			✓
130	Monthly Degree Days Heating			✓
131	Monthly Degree Days Cooling			✓
132	Monthly Wind Run			✓
133	Yearly Degree Days Heating			✓
134	Yearly Degree Days Cooling			✓
135	Yearly Wind Run			✓
136	Stress Index			✓
137	Comfort Index			✓
138	Forecast		✓	

No.	Parameter Name	Measured by Station	Calculated by Station	Calculated by VWS
139	Pressure Condition (Rising/Falling)		✓[5]	
140	Barometric Pressure Condition (Rising / Falling)			✓
141	Beaufort Scale			✓
142	Date			✓
143	Time			✓
144	Sunrise			✓
145	Sunset			✓
146	Moonrise			✓
147	Moonset			✓

Table 7 - Complete Parameter List

6.18 Daily, Monthly and Yearly Summary

Virtual Weather Station provides a daily, monthly and yearly summary. The high, low, averages and integrated values are recorded as well as the time and date of the highs and lows. You can edit the daily extremes. The summary data is independent of the database as described in Chapter 6.13 - Database.

6.18.1 Recalling the Daily, Monthly and Yearly Summary

Menu Shortcut: Settings ▶ Recall Daily, Monthly and Yearly Archive

To recall the daily, you will be prompted for a file with the following format:

- 2001, which corresponds to the yearly extremes, averages and rates for the year 2001.
- 2001_10, which corresponds to the monthly extremes, averages and rates for October 2001.
- 2001_10_01, which corresponds to the daily extremes, averages and rates for October 1, 2001.

[5] Reported by WM-918 and WX-200 weather stations only

6.18.2 Daily Summary

Figure 20 - Daily Summary provides a daily summary of the high, low, average and integrated (degree day and wind run) values for the day. The values can be changed by entering the new number in the text field (with the exception of the predominant wind direction).

The display includes the number of samples for the day. This panel is updated every minute.

To review data from a previous date, enter the month, day and year in the **Recall Archive Record** text field.

6.18.3 Monthly Summary

Provides a monthly summary of the high, low, average and integrated (degree day and wind run) values for the month. The values can be changed by entering the new number in the text field (with the exception of the predominant wind direction).

The display includes the number of samples for the month. This panel is updated hourly.

6.18.4 Yearly Summary

Provides a yearly summary of the high, low, average and integrated (degree day and wind run) values for the year. The values can be changed by entering the new number in the text field (with the exception of the predominant wind direction).

The display includes the number of samples for the year. This panel is updated hourly.

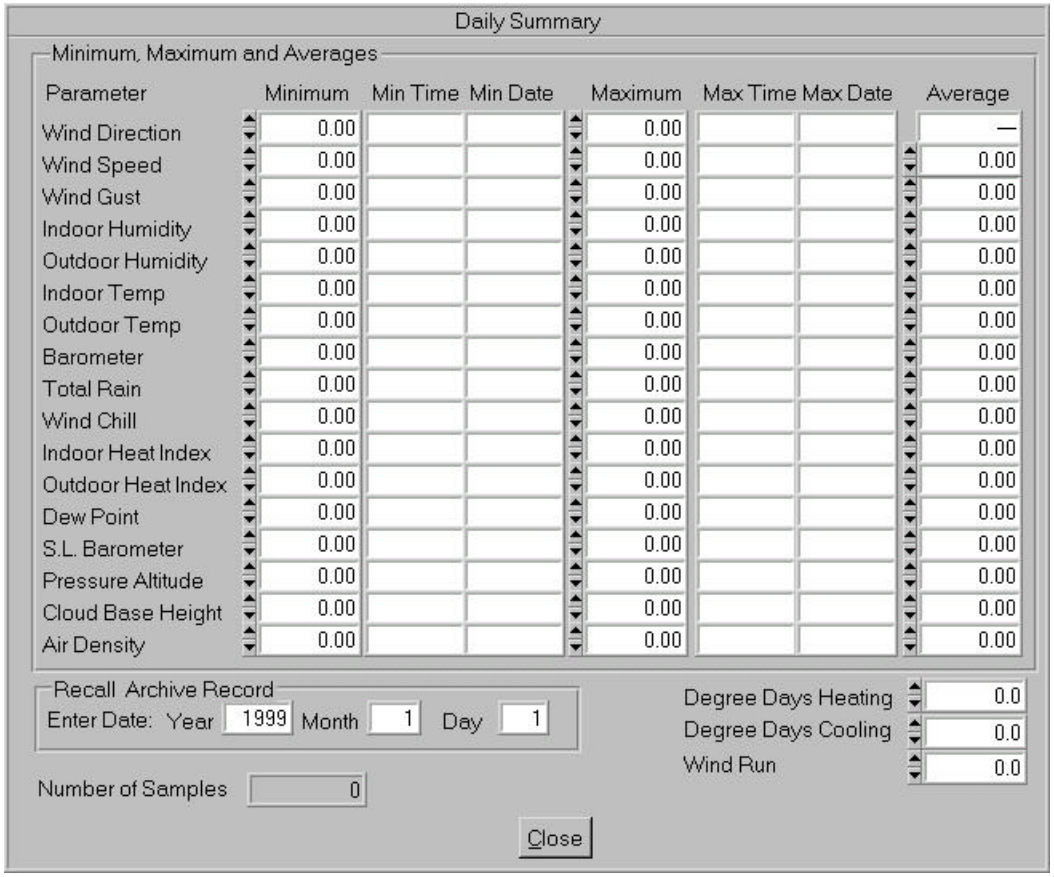

Daily Summary
Minimum, Maximum and Averages
Parameter Minimum Min Time Min Date Maximum Max Time Max Date Average
Wind Direction 0.00 0.00 —
Wind Speed 0.00 0.00 0.00
Wind Gust 0.00 0.00 0.00
Indoor Humidity 0.00 0.00 0.00
Outdoor Humidity 0.00 0.00 0.00
Indoor Temp 0.00 0.00 0.00
Outdoor Temp 0.00 0.00 0.00
Barometer 0.00 0.00 0.00
Total Rain 0.00 0.00 0.00
Wind Chill 0.00 0.00 0.00
Indoor Heat Index 0.00 0.00 0.00
Outdoor Heat Index 0.00 0.00 0.00
Dew Point 0.00 0.00 0.00
S.L. Barometer 0.00 0.00 0.00
Pressure Altitude 0.00 0.00 0.00
Cloud Base Height 0.00 0.00 0.00
Air Density 0.00 0.00
Recall Archive Record
Enter Date: Year 1999 Month 1 Day 1
Degree Days Heating 0.0
Degree Days Cooling 0.0
Wind Run 0.0
Number of Samples 0
Close

Figure 20 - Daily Summary

6.18.5 Changing Daily, Monthly or Yearly Rain

The daily rain is calculated by subtracting the minimum daily rain from the maximum daily rain. To change the daily, monthly or yearly rain, you must calculate the difference between the daily maximum and minimum rain, and enter it in the minimum rain field.

The daily rain is stored by Virtual Weather Station as the difference between the maximum daily rain and the minimum daily rain, or:

Daily Rain = Maximum Daily Rain - Minimum Daily Rain

To change the total rain, modify either the daily maximum rain or minimum rain field.

The same is true for monthly and yearly rain.

Note that changing the daily rain does not change the monthly or yearly rain automatically. You must edit the monthly and yearly rain fields as well.

Your station is not capable of reporting daily rain, so Virtual Weather Station must be operating 24-hours per day to capture the total amount. Virtual Weather Station does calculate the total rain

for yesterday, so this information can be entered on the next day.

6.19 Alarms and Memory (WM-918 and WX-200 only)

Menu Shortcut: Settings ▶ Alarms and Memory

The WX-200 and WM-918 stations provide alarm and historical high and low data. The battery status is also shown in this window.

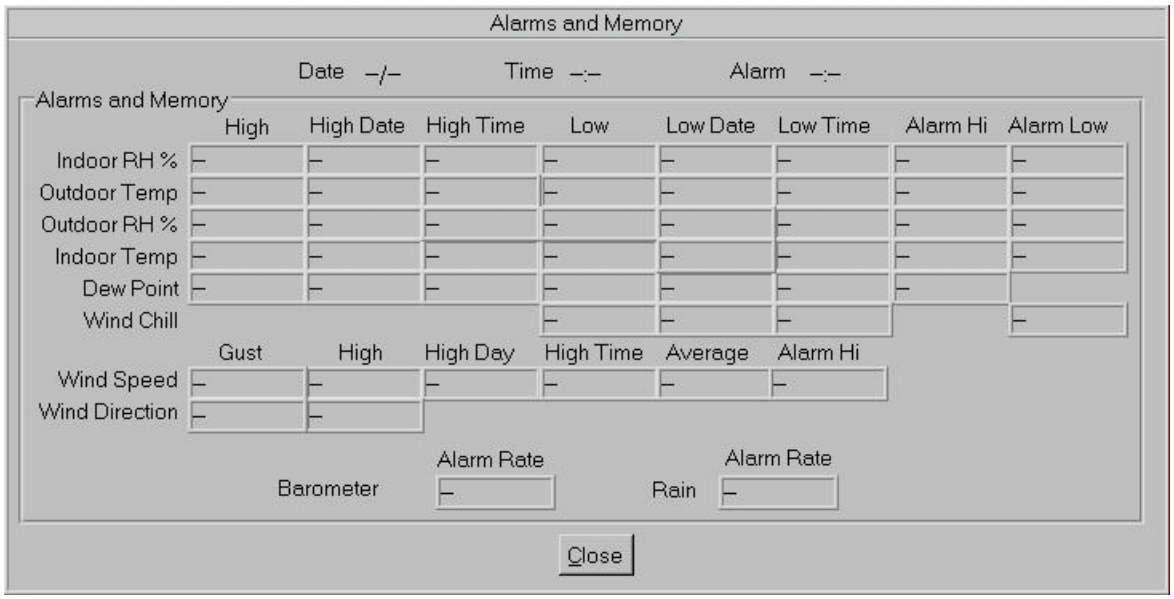


Figure 21- Alarms and Memory (WM-918 and WX-200 only)

6.20 Alarms

Menu Shortcut: Settings ▶ Alarms

NOTE: You must have a properly functioning sound card for this feature to work.

You can program Virtual Weather Station to play a wav sound, launch an executable or send an EMail when a specific alarm condition occurs. For example, play a wind chime when the wind speed limit is exceeded, a lightning sound when the rain rate is exceeded, or a bird chirp when the temperature is high enough to open windows in the house. In addition, you can run an executable or batch file when a condition is exceeded.

6.20.1 Alarm Settings

- **Parameter**. Specify the alarm parameter
- **Condition.** Specify the condition required for the alarm to sound.

Example:

"Send an alarm when the Outside Temperature is less than 70.00"

Outside Temperature < 70.00

"Send an alarm when the Wind Speed is greater than 20.00"

Wind Speed > 20.00

- **Sound (Wav) or Exectutable (exe, com, bat) Filename**. Specify the wav file to play or the executable to run.

  VWS includes sample wav files in the sounds sub-directory.

  Reference Section 6.20.2 for details on launching executable or batch files.

- **Browse**. Browse to the wav file location.

- **Alarm LED**. LED Displays RED when the alarm condition is met. Otherwise, the alarm LED will remain gray.

- **Alarm Timer.** Specifies the frequency you wish to sound the alarm. The alarm is also played at start-up.

6.20.2 Launching Executable or Batch Files

VWS starts running a program and returns without waiting for it to exit. The executable can be either an MS DOS or MS Windows executable, including *.exe, *.com, *.bat and *.pif files.

If you need to execute a command built into command.com such as copy, dir, etc, you can call "command.com /C DosCommand args",

where DosCommand is the shell command you want to be executed.

For example, "command.com /C copy c:\\temp\\file.tmp c:\\tmp" would copy file.tmp from the temp directory to the tmp directory. Refer to your DOS documentation for further help with command.com.

.exe, .com, and .bat DOS programs use the settings in default.pif (in your Windows directory) when running. You can change their priority, display options, etc., by editing default.pif or by creating another pif file. Refer to your Microsoft Windows documentation for help on creating and editing pif files.

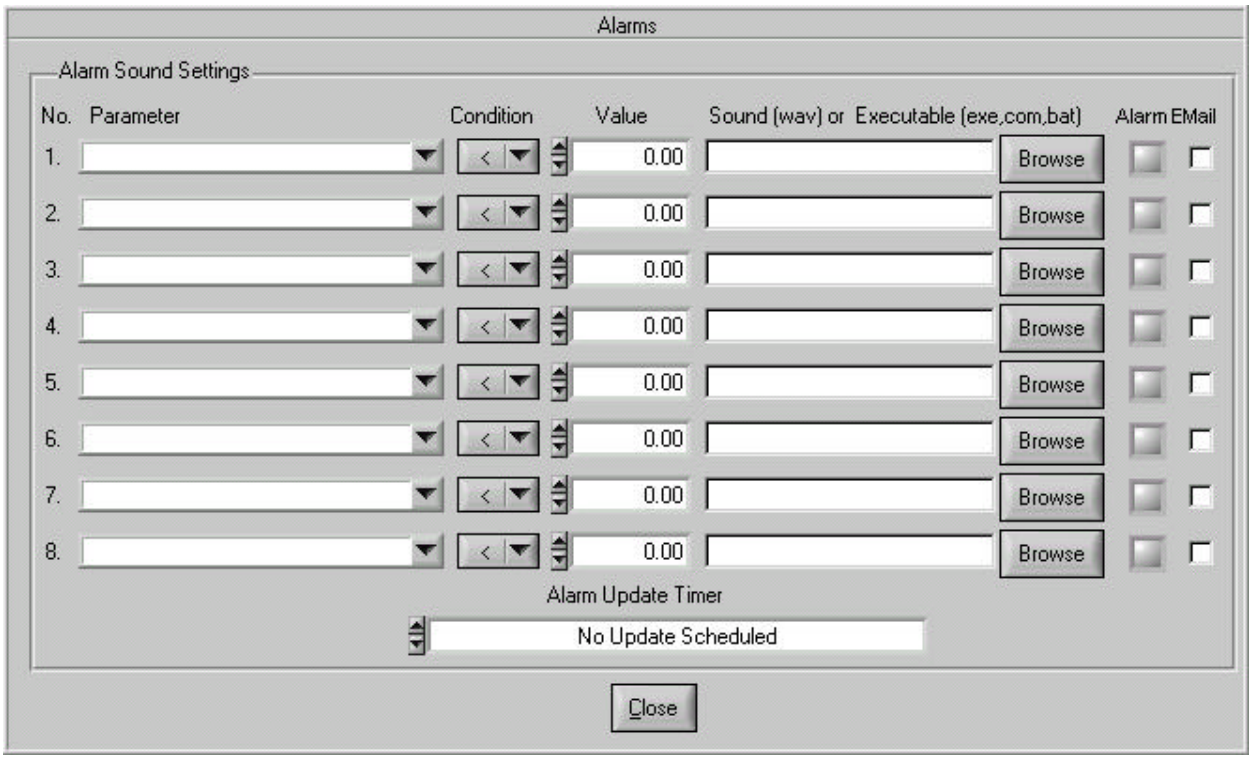


Figure 22 - Alarm Sound Settings

6.21 Synchronize Date and Time

Menu Shortcut: Settings ▶ Synchronize Date and Time

Your computer may lose time because of accuracy of the ROM BIOS. Virtual Weather Station allows you to synchronize your computer clock to the Weather Station's clock automatically. This is particularly useful because the WMR-918 and WMR-968 are equipped with the RF Clock feature that synchronizes to the atomic clock (Europe only).

Check your WMR-918 / 968 Weather Station Instruction Manual for more details on this feature.

Note that you must be the Administrator for this function to work on an NT based machine. Make

The WM-918 station does not report the year, so careful attention must be taken at the beginning of each year.

6.22 Desktop Options

6.22.1 The Taskbar

Virtual Weather Station displays an icon on your taskbar. To hide Virtual Weather Station,

double click the Virtual Weather Station icon on your taskbar. To display Virtual Weather Station when hidden, double click on the Virtual Weather Station icon again.

6.22.2 The Toolbar

When minimized, Virtual Weather Station displays the following parameters on your toolbar:

Outdoor Temperature Outdoor Humidity Wind Direction @ Wind Speed

6.23 Rainwise Settings

The Rainwise Weather Station includes a programmable data logger. Reference Figure 23 - Rainwise Settings. The following settings can be adjusted.

6.23.1 Sea-level Barometer Adjustment (418 MHz systems only)

The sea-level barometer setting can be adjusted in the Rainwise Computer Interface. In addition, the barometer. You can also adjust the barometer in the calibration offset. See Section 6.2 for more details.

6.23.2 Reset Barom to Absolute Pressure

Removes the sea-level offset adjustment

6.23.3 Reset Daily Min/Max Data

All minimum and maximum sensor values are set to the current sensor values and the current time. Note that the minimum and maximum values are automatically logged to memory and reset daily and midnight.

6.23.4 Reset Daily and Monthly Rainfall

Resets the daily and monthly rainfall in the logger's memory.

6.23.5 Reset Total Rainfall to Zero

Resets the total rainfall to zero in the logger's memory

6.23.6 Reset High Windspeed

Resets the high windspeed to zero in the logger's memory

6.23.7 Clear All Logged Data

Clears all of the data in the data logger's memory.

6.23.8 No. Items Logged

The number of items logged (proceeded by the cursor prompt >).

6.23.9 Update Computer Interfaces Clock

Updates the computer interfaces clock, with the following format:

MMDDhhmmss

Where MM is month

DD is day

hh is hour (24 hour time)

mm is minute

ss is second

6.23.10 Increment Logging Interval

The computer interface switches to the next logging interval, and outputs the new value below.

1, 2, 5, 10, 15, 20, 30, or 60 minutes

6.23.11 Battery Voltage

Sensor package battery voltage

6.23.12 Version

EEPROM revision code for the interface and sensor package.

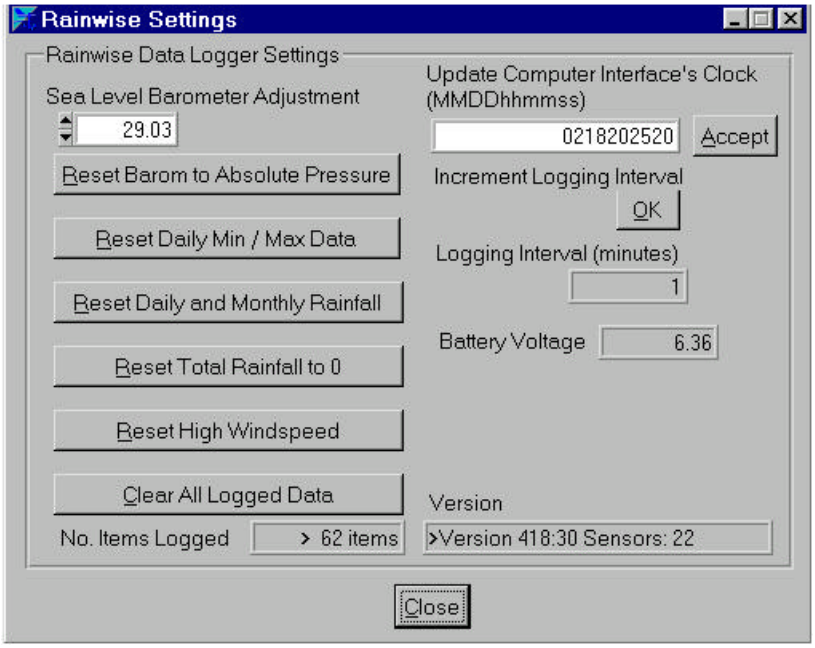


Figure 23 - Rainwise Settings

6.24 Rainwise Data Logger

Your Rainwise Computer Interface is equipped with a Data Logger. Each time the program starts, Virtual Weather Station downloads the data recorded since the last time the software communicated to the Rainwise Computer Interface. Each recorded data point will be updated to the display.

6.25 Vantage / Weather Link Settings

6.25.1 Vantage Pro Settings

Menu Shortcut: Settings ▶ Vantage / WeatherLink Settings

The Davis weather station console can be programmed for calibration offsets, barometric pressure sea-level correction, and setting date and time.

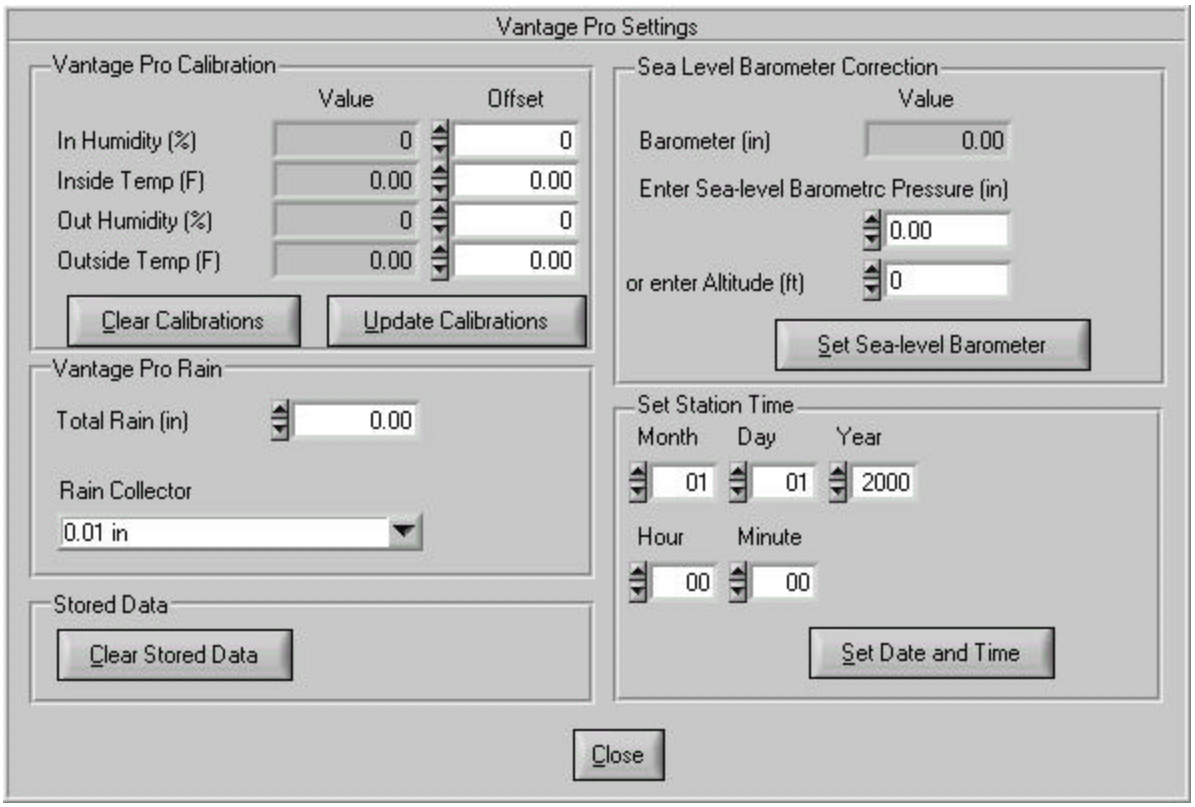


Figure 24 – Vantage/WeatherLink Settings

6.25.2 Vantage / WeatherLink Highs and Lows

Menu Shortcut: Settings ▶ Vantage Highs and Lows

The highs and lows are stored in the Davis weather station console. You can automatically reset these highs and lows (Weather Monitor II and Weather Wizard III only) at a given time of day based on the schedule.

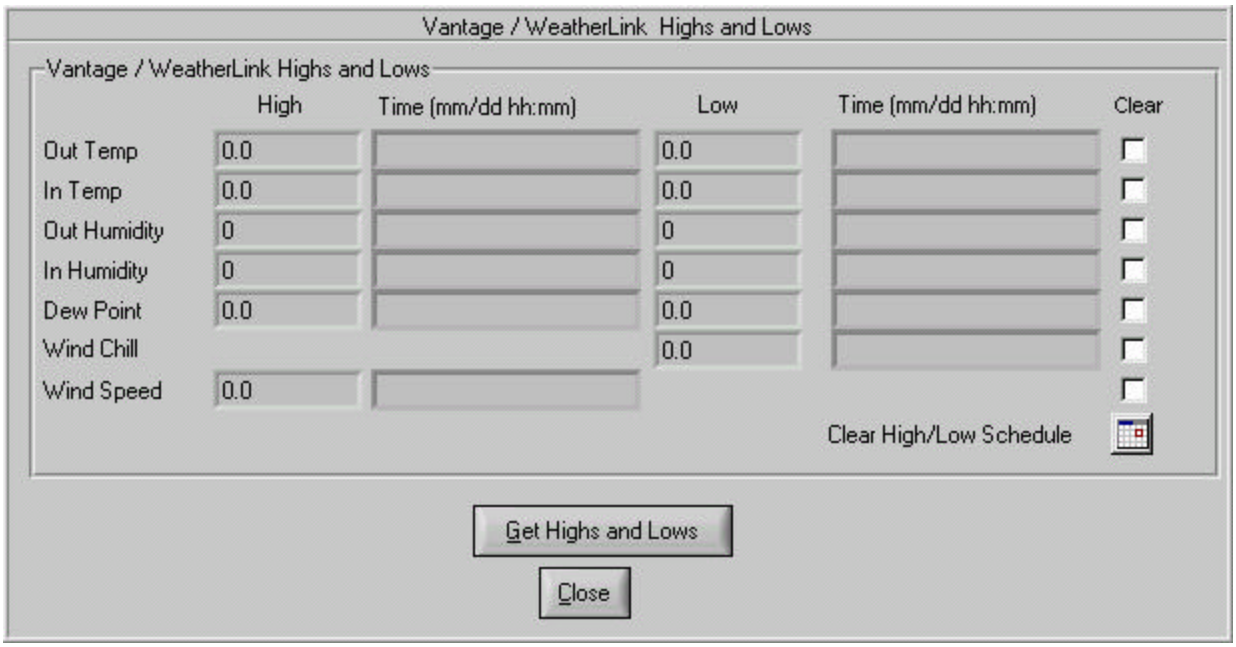


Figure 25 – Vantage / WeatherLink Recorded Highs and Lows

6.25.3 Vantage / WeatherLink Alarm Settings

Menu Shortcut: Settings ▶ Vantage Alarm Settings

Davis weather station console audible alarms can be set and cleared.

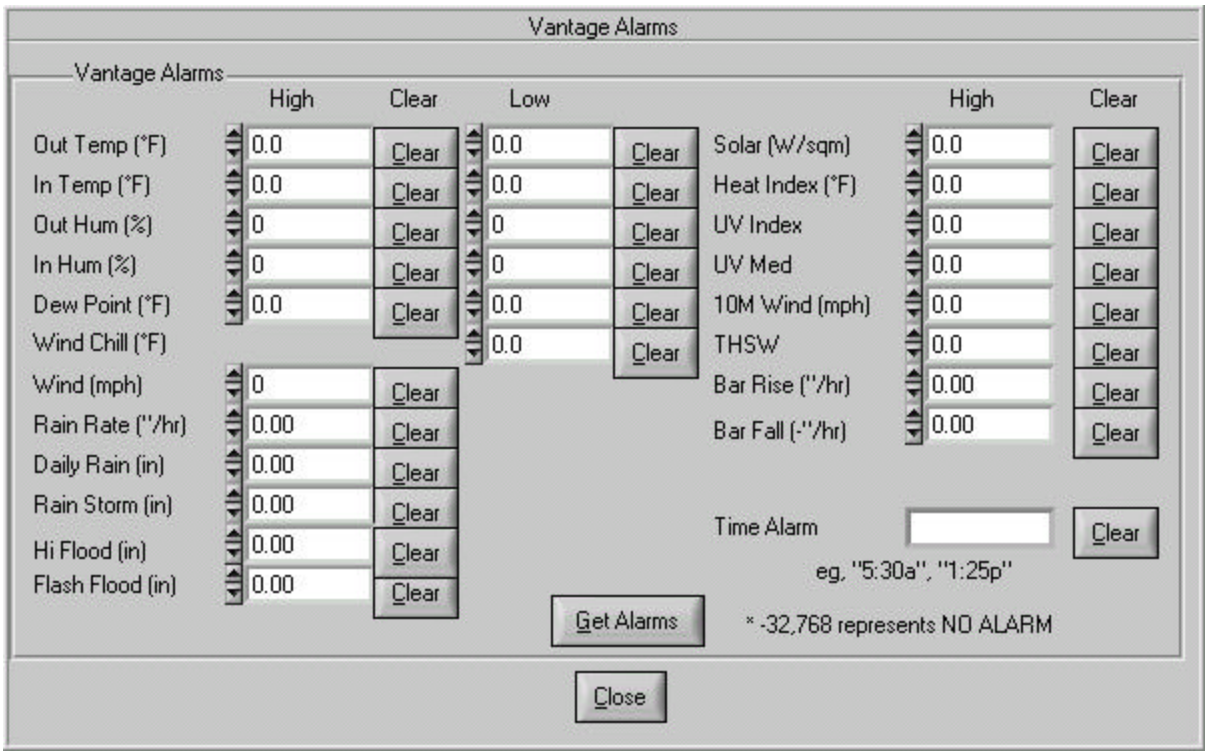


Figure 26 – Vantage / WeatherLink Alarms

6.26 CSV File Export

Real-time Data can be exported to a csv file for other programs to utilize. Two files are created:

- data.csv – this file uses the native units as described in Figure 27 – CSV Output File Format.
- data2.csv – this file uses the converted units as specified by the user (example, °C for temperature)

The data is formatted as follows:

```
1.00,2001,10,28,0,6,59,0,0,48,42,100,77,53,30,30.14,0.76,0.00,0,0,0,0,0,0,0,0
.00,0,0,53,77,53,53,0.000,52,0,0,0
```

Column	Identifier	Prototype
1	Csv File Version ID (XX.XX)	Floating Point
2	Year (yyyy format)	Integer
3	Month	Integer
4	Day	Integer

Column	Identifier	Prototype
5	Hour (24-hour format)	Integer
6	Minute	Integer
7	Second	Integer
8	Wind speed (mph)	Floating Point
9	Wind Gust (mph)	Floating Point
10	Wind Direction (degrees)	Floating Point
11	Inside Humidity (%)	Floating Point
12	Outside Humidity (%)	Floating Point
13	Inside Temperature (°F)	Floating Point
14	Outside Temperature (°F)	Floating Point
15	Barometer (in)	Floating Point
16	Total Rain (in)	Floating Point
17	Daily Rain (in)	Floating Point
18	Hourly Rain (in)	Floating Point
19	Weather Condition, where: 0 = clear 1 = few clouds 2 = scattered clouds 3 = broken clouds 4 = overcast 5 = drizzle 6 = rain 7 = frozen rain 8 = showers 9 = mist 10 = tornado 11= fog 12 = smoke 13 = hail 14 = haze 15 = ice crystals 16 = sand 17 = snow grains 18 = snow 19 = snow showers 20 = lightning 21 = thundershowers	Integer

Column	Identifier	Prototype
20	Channel 1 Temperature (WMR-968/WMR-918 only)	Floating Point
21	Channel 1 Humidity (WMR-968/WMR-918 only)	Floating Point
22	Channel 2 Temperature (WMR-968/WMR-918 only)	Floating Point
23	Channel 2 Humidity (WMR-968/WMR-918 only)	Floating Point
24	Channel 3 Temperature (WMR-968/WMR-918 only)	Floating Point
25	Channel 3 Humidity (WMR-968/WMR-918 only)	Floating Point
26	Evapotranspiration (Vantage Pro Plus only)	Floating Point
27	UV Index (Vantage Pro Plus only)	Floating Point
28	Solar Radiation (Vantage Pro Plus only)	Floating Point
29	Wind Chill (° F)	Floating Point
30	Indoor Heat Index (° F)	Floating Point
31	Outdoor Heat Index (° F)	Floating Point
32	Dew Point (° F)	Floating Point
33	Rain Rate (in/hour)	Floating Point
34	Outdoor Temp Rate (° F/hr)	Floating Point
35	Indoor temp Rate (° F/hr)	Floating Point
36	Barometer Rate (in/hr)	Floating Point
37	Channel 1 Temp Rate (° F/hr)	Floating Point
38	Channel 2 Temp Rate (° F/hr)	Floating Point
39	Channel 3 Temp Rate (° F/hr)	Floating Point

Figure 27 – CSV Output File Format.

6.27 Other Display Features

6.27.1 Minimizing the Program and Display

When the display is minimized, the title bar displays the outdoor temperature, humidity, wind direction and windspeed on the taskbar.

Figure 28 – Minimized Taskbar Display

6.27.2 Hiding Virtual Weather Station

To hide Virtual Weather Station, double click on the Taskbar icon. To display after hiding, double click on the taskbar.

Figure 29 – Virtual Weather Station Taskbar Icon

6.28 WeatherLink Automation (Davis Instruments only)

Menu Shortcut: Settings ▶ WeatherLink / PCLink Automation

You can automatically download data to the WeatherLink program using Virtual Weather Station. This assures that data is stored in both programs for users that wish to continue the WeatherLink database.

Enter Your Station Directory, the location of the WeatherLink executable file, and select if you want to automatically generate NOAA monthly and yearly summary reports within WeatherLink.

Enter a scheduled time to automate the process.

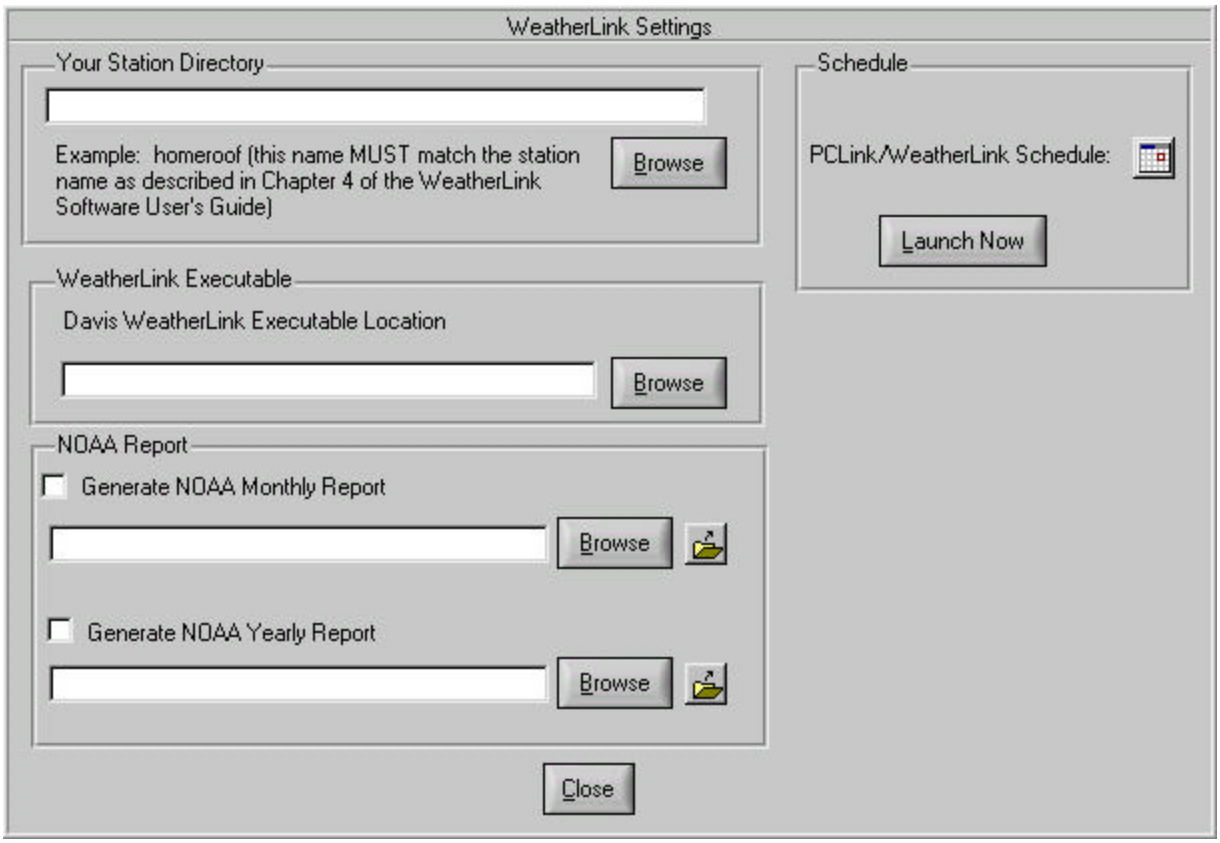


Figure 30 – WeatherLink Settings

7 Virtual Weather Station Pro Edition

(formally Weather Lab)

7.1 File Settings (Data Logging)

Menu Shortcut: Settings ▶ File Settings

Virtual Weather Station includes a data logger, which provides a permanent record of your weather data.

The data is stored in several file formats:

- Report Format. Provides formatted data for viewing (daily file)
- Comma Separated Data (csv) format. This format is for export to Microsoft Excel or other analysis programs.
- Archive Format. This format provides the highs, lows and average for the day, month and year.

7.1.1 Daily File

The Daily File is a text file stored in the following location:

\VWS\data\daily\daily.txt

This file is recreated every day. The file is formatted with data organized into fixed column widths. This format is ideal for display purposes.

Since the file name never changes (daily.txt), it can be statically linked from web pages or other files.

7.1.2 Date Stamped File

To create a new date stamped file every day, select this checkbox, as shown in Figure 33 - File Settings. The data is stored in the following location:

\VWS\data\daily\yyyymmdd.txt

where yyyy is the year, mm is the month and dd is the day.

For example, data stored on May 9, 2000 is designated by the filename:

\VWS\data\20000509.txt

The date stamped format is the same as the daily.txt format.

7.1.3 Csv File

A csv file (comma separated file) is a standard format for reading data into Excel (for example). Excel recognizes csv format and parses the data into separate columns.

To create a csv file, select the checkbox as shown in Figure 33 - File Settings.

The data is stored in the following location:

\VWS\data\csv\yyyymmdd.csv

where yyyy is the year, mm is the month and dd is the day.

For example, data stored on May 9, 2000 is designated by the filename:

\VWS\data\csv\20000509.csv

7.1.4 Archive File

The archive text files consist of highs, lows and averages for archived data on a daily, monthly and yearly basis. An example of this file is shown in Figure 31 – Archived Data Text File.

Parameter	Max	Max Time	Min	Min Time	Average
Wind Direction	353	4:31pm	140	4:11pm	250
Wind Speed	5.1	3:08pm	0.0	2:18pm	1.4
Wind Gust	6.5	2:42pm	0.0	3:09pm	2.3
In Humidity	42	2:18pm	30	3:09pm	34
Humidity	42	4:11pm	30	3:09pm	34
In Temp	74.7	4:46pm	50.0	3:09pm	59.6
Out Temp	76.3	2:18pm	70.0	3:09pm	73.5
Barometer	29.03	2:18pm	29.00	3:09pm	29.01
Total Rain	1.02	2:18pm	0.00	2:18pm	0.82
Ch 1 Temp	0.0	2:18pm	0.0	2:18pm	0.0
Ch 1 Humidity	0	2:18pm	0	2:18pm	0
Ch 2 Temp	0.0	2:18pm	0.0	2:18pm	0.0
Ch2 Humidity	0	2:18pm	0	2:18pm	0
Ch 3 Temp	0.0	2:18pm	0.0	2:18pm	0.0
Ch 3 Humidity	0	2:18pm	0	2:18pm	0
Wind Chill	76.3	2:18pm	60.0	3:09pm	63.4
In Heat Ix	74.7	4:46pm	65.2	3:09pm	69.2
Out Heat Ix	75.7	2:18pm	66.2	3:09pm	69.1
Dew Point	46.7	4:11pm	39.0	3:09pm	40.2
SL Barometer	29.03	2:18pm	29.00	4:49pm	29.01

Figure 31 – Archived Data Text File

7.1.4.1 Daily Archive Files

The daily archive files are stored in the following location:

\VWS\data\archive\daily\dailyarc.txt

7.1.4.1.1 Previous Daily Files

1-5 day old daily files are stored as follows:

- \VWS\data\archive\daily\daily_2.txt . Yesterdays daily archive file
- \VWS\data\archive\daily\daily_3.txt. Two days ago
- \VWS\data\archive\daily\daily_4.txt. Three days ago.

7.1.4.2 Monthly Archive Files

The daily archive files are stored in the following location:

\VWS\data\archive\monthly\monthlyarc.txt

7.1.4.3 Yearly Archive Files

The daily archive files are stored in the following location:

\VWS\data\archive\yearly\yearlyarc.txt

7.1.5 Date Stamped Archive File

Date stamped archive files are ideal for storing historical data.

To create a new date stamped archive file every day, select this checkbox, as shown in Figure 33 - File Settings.

7.1.5.1 Date Stamped Archive Daily Files

The data is stored in the following location:

\VWS\data\archive\daily\yyyymmdd.txt

where yyyy is the year, mm is the month and dd is the day.

For example, data stored on May 9, 2000 is designated by the filename:

\VWS\data\archive\20000509.txt

The date stamped format is the same as the daily.txt format.

7.1.5.1.1 Previous Daily Files

1-5 day old daily files are stored as follows:

- \VWS\data\archive\daily\daily_2.txt . Yesterdays daily text file
- \VWS\data\archive\daily\daily_3.txt. Two days ago
- \VWS\data\archive\daily\daily_4.txt. Three days ago.

7.1.5.2 Date Stamped Archive Monthly Files

The data is stored in the following location:

\VWS\data\archive\monthly\yyyymm.txt

where yyyy is the year, mm is the month.

For example, data stored on May, 2000 is designated by the filename:

\VWS\data\archive\20000.txt

The monthly stamped format is the same as the monthly.txt format.

7.1.5.3 Date Stamped Archive Yearly Files

The data is stored in the following location:

\VWS\data\archive\daily\yyyy.txt

where yyyy is the year.

For example, data stored for the year 2000 is designated by the filename:

\VWS\data\archive\yearly\2000.txt

The year stamped format is the same as the yearly.txt format.

7.1.6 Summary Files

This file provides a summary of the average, high and low values for each parameter specified in the File Parameter List (reference Section 7.1.8).

The file is stored in the following location:

\vws\data\summary\daysum.txt

An example is shown in Figure 32 – Example Daily Summary File.

Date	Humidity	Hi	Lo	Temp	Hi	Lo
	%	%	%	°F	°F	°F
10/11/2001	78	100	29	63	82	49
10/12/2001	52	100	8	68	86	51
10/13/2001	35	76	13	70	90	53
10/14/2001	60	95	14	66	92	49
10/15/2001	68	100	15	67	91	50
10/16/2001	73	100	21	66	87	52
10/17/2001	78	100	24	62	82	47
10/18/2001	75	100	16	62	82	47
10/19/2001	83	100	27	62	83	49
10/20/2001	90	100	64	61	74	52

Figure 32 – Example Daily Summary File

7.1.7 File Update Timer

Specify the update or record rate of the data to file.

7.1.8 Create / Modify File List

Virtual Weather Station allows you to record over 90 different parameters. Select the parameters for recording from this list.

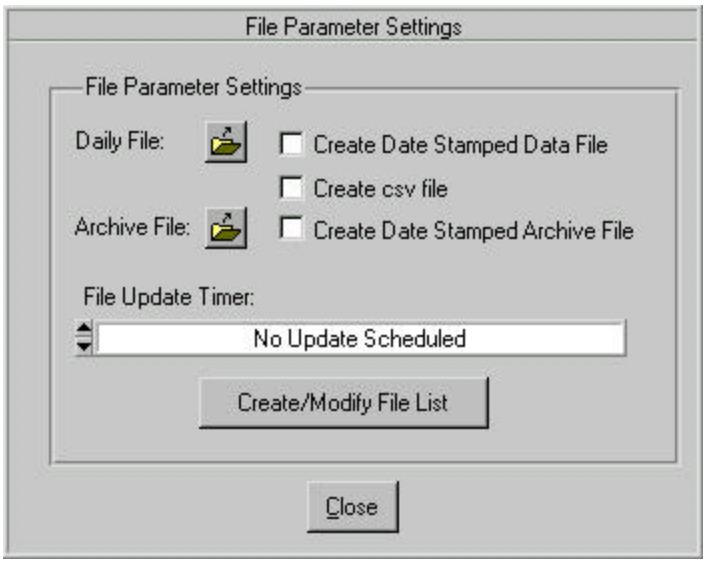


Figure 33 - File Settings

7.2 Climate Reports

There are two types of climate reports - monthly and yearly.

7.3 Monthly Climate Report

Menu Shortcut: Reports ▶ Monthly Report

The monthly report consists of the following data for each day of the month:

- **Day**. Each row in the report shows information for a single day. The date for each row appears at the left of the row.
- **Mean Temp**. The mean temperature for the day. At the bottom, the mean temperature for the month is shown.
- **High and Time**. The high temperature for the day and the time at which it occurred. At the bottom of the column, the highest temperature recorded during the month and the day on which it occurred is displayed.
- **Low and Time**. The low temperature for the day and the time at which it occurred. At the bottom of the column, the lowest temperature recorded during the month and the day on which it occurred is displayed.
- **Heat Deg-Days**. The number of heating degree-days accumulated on each day. At the bottom of the column, the total heating degree-days accumulated during the month is displayed.

- **Cool Deg-Days**. The number of cooling degree-days accumulated on each day. At the bottom of the column, the total cooling degree-days accumulated during the month is displayed.
- **Rain**. The rainfall accumulated on each day. At the bottom of the column, the total rainfall accumulated during the month is displayed.
- **Average Wind Speed**. The average wind speed for the day. At the bottom of the column, the average wind speed for the month is displayed.
- **High (Wind Speed) and Time**. The high wind speed for the day and the time at which it occurred. At the bottom of the column, the highest wind speed recorded during the month and the day in which it occurred is displayed.
- **Dom Dir**. The dominant wind direction for the day. At the bottom of the column, the dominant wind direction recorded during the month is displayed.

7.3.1 Modifying the Monthly Climate Report

Menu Shortcut: Settings ▶ Monthly Archive

To modify the monthly climate report, enter the month and year, and modify the stored values.

7.4 Yearly Climate Report

Menu Shortcut: Reports ▶ Yearly Report

The yearly report consists of the following data for each month of the year:

- **Mon**. Each row in the report shows information for a month day. The month for each row appears at the left of the row.
- **Mean Temp**. The mean temperature for the month. At the bottom, the mean temperature for the year is shown.
- **High and Date**. The high temperature for the month and the date at which it occurred. At the bottom of the column, the highest temperature recorded during the year and the day on which it occurred is displayed.
- **Low and Date**. The low temperature for the month and the date at which it occurred. At the bottom of the column, the lowest temperature recorded during the year and the day on which it occurred is displayed.
- **Heat Deg-Days**. The number of heating degree-days accumulated for each month. At the bottom of the column, the total heating degree-days accumulated during the year is displayed.

- **Cool Deg-Days**. The number of cooling degree-days accumulated for each month. At the bottom of the column, the total cooling degree-days accumulated during the year is displayed.
- **Rain**. The rainfall accumulated for each month. At the bottom of the column, the total rainfall accumulated during the year is displayed.
- **Average Wind Speed**. The average wind speed for the month. At the bottom of the column, the average wind speed for the year is displayed.
- **High (Wind Speed) and Date**. The high wind speed for the month and the time at which it occurred. At the bottom of the column, the highest wind speed recorded during the year and the day in which it occurred is displayed.
- **Dom Dir**. The dominant wind direction for the month. At the bottom of the column, the dominant wind direction recorded during the year is displayed.

7.4.1 Modifying the Yearly Climate Report

Menu Shortcut: Settings ▶ Yearly Archive

To modify the yearly climate report, enter the year, and modify the stored values.

7.5 Climate Report Text File and Printing Climate Reports

A text file is generated once per day for both the monthly and yearly climate report (or whenever the window is opened for viewing). You can print this text file to create a permanent record of this report.

The monthly text file is located at the following location:

\VWS\data\noaa\yyyy_mm.txt

where yyyy is the year and mm is the month.

The yearly text file is located at the following location:

\VWS\data\noaa\yyyy.txt

where yyyy is the year.

7.6 X10 Home Automation with Virtual Weather Station, HomeSeer

7.6.1 General Description

You can connect your home automation system to your personal weather station, and create a powerful environmental monitoring system.

Ambient makes this possible with **Virtual Weather Station's Home Automation System** (http://www.weatherconnect.com/x10). The combination of your weather station and automated controls improves the comfort and efficiency of your home at a fraction of the cost of other automated environmental systems.

With Virtual Weather Station's home automation plug-in tools, you can:

- Control the thermostat based on feedback signals from handheld temperature sensors placed throughout your home, or a low cost zone control system.
- Monitor and control the thermostat based on Comfort Index or change thermostat set points based on rate of change of temperature.
- Turn on the ceiling fan when the bedroom comfort index is exceeded.
- Control whole house fans to draw in cool air from the outside when the outdoor temperature is lower than the inside temperature
- Control sprinkler systems after a rain.
- Control your irrigation system
- Monitor and control your pool, spa or air conditioning systems.
- Monitor your home automation and environmental conditions from anywhere in the world over the Internet.

7.6.2 X10 Controls

Virtual Weather Station communicates to HomeSeer (www.homeseer.com) home automation software to provide a complete environmental control and monitoring system using X10 Control Technology.

X10 is a communications protocol based on Powerline Carrier (PLC) technology, which uses your home's existing electrical wiring to communicate with controls lights and appliances. X10 is easily installed into existing homes, and X10 control devices can be upgraded or changed easily.

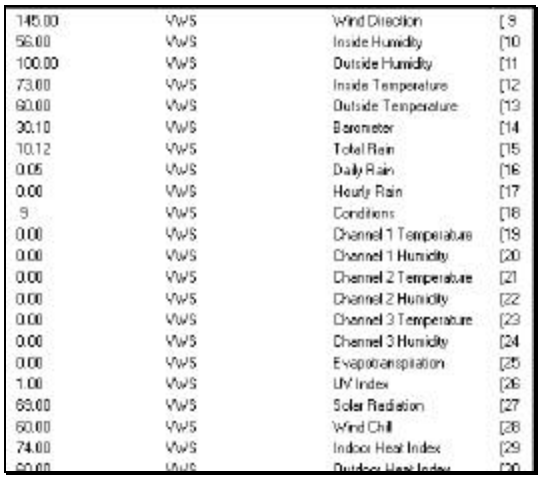
7.6.3 HomeSeer Automation Software Description

HomeSeer is home automation software that uses inexpensive X10 technology to control your

lights, appliances, and audio/video equipment. With a built-in web browser, access to your home is only a click away. HomeSeer was designed to be easy to use, affordable, and extendable. Novice users will find the clean Outlook like interface easy to understand, while power users will welcome the ability to create sophisticated scripts to control just about anything.

7.6.4 How the Home Automation System Works

Virtual Weather Station communicates to HomeSeer using a Plug-in module provided with Virtual Weather Station's Home Automation Toolkit. HomeSeer can be programmed to automatically control your home or business by communicating via RS232 or USB to a X10 Computer Interface Module.



145.00	VWS	Wind Direction	[9
56.00	VWS	Inside Humidity	[10
100.00	VWS	Outside Humidity	[11
73.00	VWS	Inside Temperature	[12
60.00	VWS	Outside Temperature	[13
30.10	VWS	Barometer	[14
10.12	VWS	Total Rain	[15
0.05	VWS	Daily Rain	[16
0.00	VWS	Hourly Rain	[17
9	VWS	Conditions	[18
0.00	VWS	Channel 1 Temperature	[19
0.00	VWS	Channel 1 Humidity	[20
0.00	VWS	Channel 2 Temperature	[21
0.00	VWS	Channel 2 Humidity	[22
0.00	VWS	Channel 3 Temperature	[23
0.00	VWS	Channel 3 Humidity	[24
0.00	VWS	Evapotranspiration	[25
1.00	VWS	UV Index	[26
63.00	VWS	Solar Radiation	[27
60.00	VWS	Wind Chill	[28
74.00	VWS	Indoor Heat Index	[29
60.00	VWS	Outdoor Heat Index	[30

Figure 34 –Virtual Weather Parameter Listing in HomeSeer.

7.6.5 Configuring HomeSeer

After purchasing and installing HomeSeer and the HomeSeer Virtual Weather Station Plug-in, configure HomeSeer as follows.

From Virtual Weather Station

1. Select **Settings | Csv Export** from the Virtual Weather Station main menu.

2. Select the Create csv output file checkbox and browse to a location on your hard drive to store the csv file.

From HomeSeer

3. Select **View | Options** from the HomeSeer Main Menu, and select the **Interfaces** Tab.

4. Under the **RF, I/O, Custom Interface** Field, **Select device to add: VWS Interface.**

5. Select **VWS Interface** in the window and select the **Setup** button.

6. Browse to the csv file location specified in Step 2.

7. Select the **Create Variables** Button to list the 39 variables VWS imports to HomeSeer. These variables will now be listed in the HomeSeer Main Menu.

7.6.6 Purchasing the Virtual Weather Station HomeSeer Plug-in

To purchase the HomeSeer plug-in, visit http://www.weatherconnect.com/x10.

8 Virtual Weather Station Internet Edition

Virtual Weather Station Internet Edition features Email, FTP File Transfer, and HTTP file transfer. You can automatically send files to an FTP server or automatically send e-mail when alarm conditions occur.

The software automatically converts display panels into jpeg images that any client using a World Wide Web (WWW or Web) browser can access. The software is compatible with standard Web browsers and requires no additional networking software or configuration.

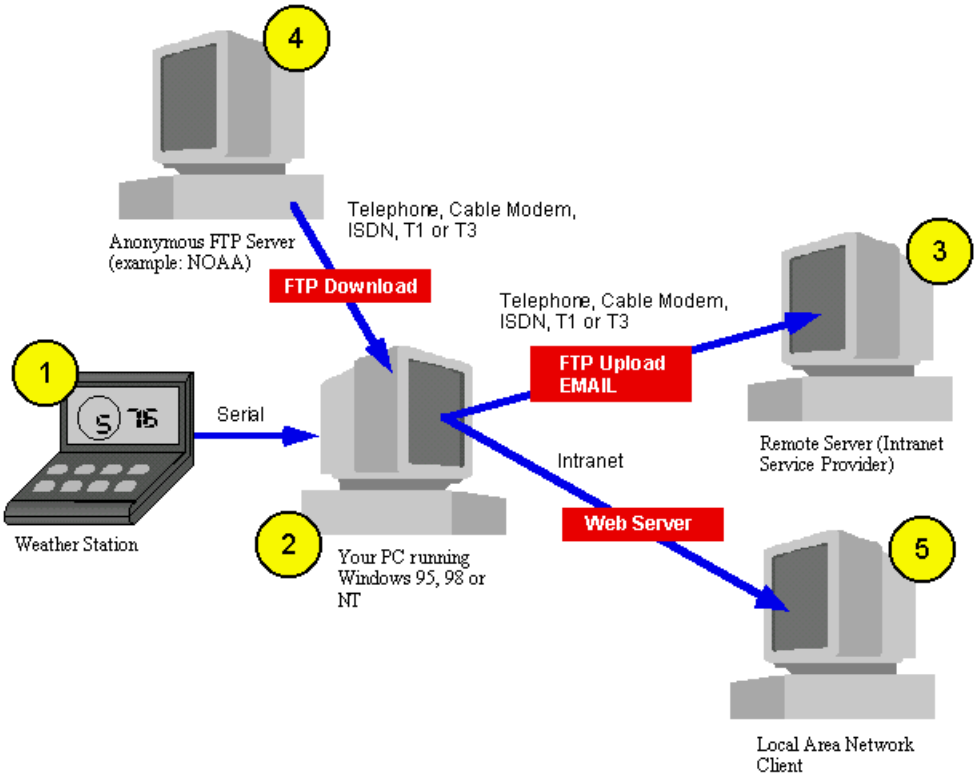


Figure 35- General Description

Referencing the figure above, the weather station (1) communicates to your PC (2) through the serial port. Virtual Weather Station displays graphics on your PC. The graphics are converted to jpeg files for insertion into your web page. Virtual Weather Station uploads these jpeg files and html text files to your remote web server (3) automatically based on a schedule you define. Weather information can also be downloaded from an anonymous ftp server (4) and incorporated into your web page.

METAR data throughout the world can be downloaded and instantly displayed on your local computer.

In addition, VWS will upload data to free weather servers, such as the Weather Underground and Hamweather.

8.1 Weather Website Builder

A weather website can be created in three simple steps. Virtual Weather Station includes pre-defined templates that can be automatically sent to your remote server.

To build your website in three simple steps:

1. Browse to your remote server location. You will need to enter the account information provided by your Internet service provider (ISP).
2. Define a schedule you would like the software to connect to the remote server by selecting the Update Schedule button.
3. View the finished web pages by selecting the Web Page Template.

Menu Shortcut: Internet ▶ Weather Website Builder

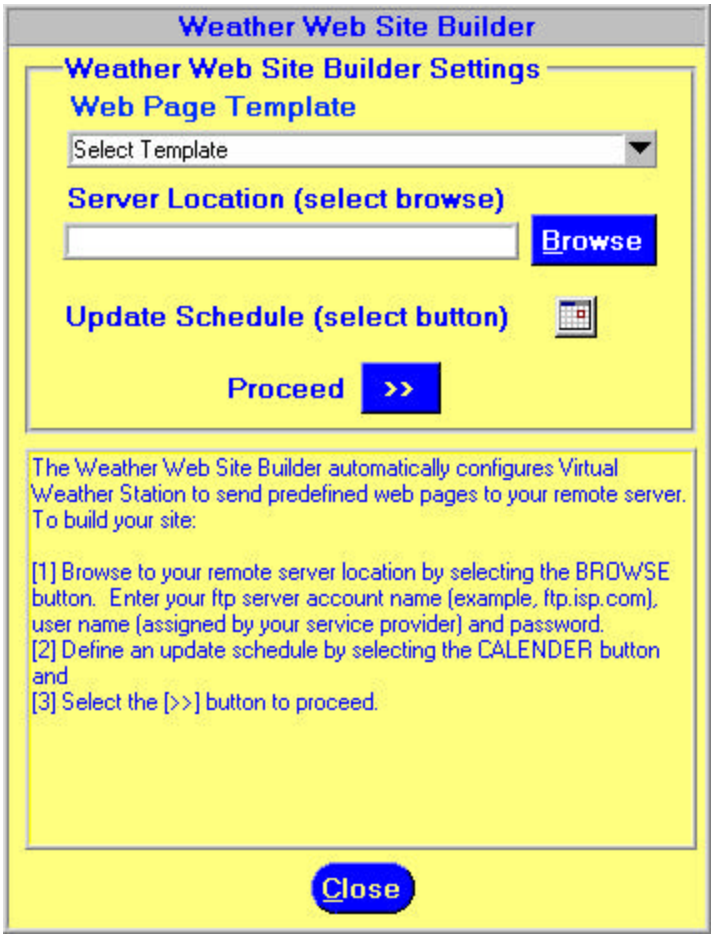

Weather Web Site Builder
Weather Web Site Builder Settings
Web Page Template
Select Template
Server Location (select browse)
Browse
Update Schedule (select button)
Proceed
>>
The Weather Web Site Builder automatically configures Virtual Weather Station to send predefined web pages to your remote server. To build your site:
[1] Browse to your remote server location by selecting the BROWSE button. Enter your ftp server account name (example, ftp.isp.com), user name (assigned by your service provider) and password.
[2] Define an update schedule by selecting the CALENDER button and
[3] Select the [>>] button to proceed.
Close

Figure 36– Weather Website Builder

8.2 Internet Features and Operation

The following section describes methods for displaying your weather data on the Internet or Intranet.

There are two primary ways to operate and display your data using Internet standards and protocols.

2. **Remote Server.** Your Web Site is located on a remote server, and you periodically transfer or ftp files. This is the most common application for Virtual Weather Station.

3. **Non Internet Protocols on Local Area Network**. Your computer is located on the Intranet, and you simply transfer jpeg files to another location on the network without using ftp or web server options.

The following sections outline settings for your specific application.

8.3 Remote Server Applications

For remote server applications, you will use the automated ftp features.

Virtual Weather Station periodically updates jpeg files, which are snapshots of the gauges and graphs displayed on Virtual Weather Station's panels. These files are linked to an html page resident on your remote server, and periodically transferred automatically.

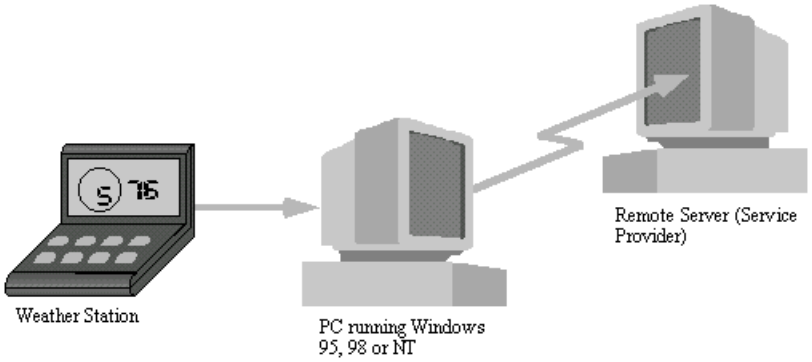


Figure 37- Remote Web Server Configuration

8.4 Connecting to the Internet

Most Internet service providers provide the following features:

4. A direct connection to the Internet
5. A remote World Wide Web Server
6. A remote Ftp Server
7. A remote E-Mail (SMTP) Server

NOTE: You must have direct access to the Internet for Virtual Weather Station's automated features to work. Connecting through a Service Provider such as America On Line (AOL) will limit Virtual Weather Station's automated features.

8.5 Network Connection

To access the Networking Settings including dial-up networking, select [Settings][Network Connection] from the menubar. Reference Figure 38 - Networking Connection Setup Panel.

There are three primary ways to connect to the Internet:

1. **Never Dial a Connection**. Typically used for routers.
2. **Use Default Connection**. Connects using the defined default connection to the Internet. Typically used for LAN and Proxy servers.
3. **Use Dial-up Networking**. Uses Virtual Weather Station's Remote Access Service (RAS) utilities for Dial-up Networking. Typically used for telephone, DSL or cable modems.

8.6 Dial-up Connection

If you specify Use Dial-up Networking, the following settings are available.

8.6.1 Number of Dial-up Attempts

Defines the number of unsuccessful dial-up attempts per session.

8.6.2 Number of Seconds to Wait Between Attempts

The number of seconds between dial-up attempts. Allows some modems extended time to hang the phone line.

8.6.3 Use the Following Dial-up Networking Connection

Select one of the dial-up networking connections defined in the Windows Dial-up Networking.

8.6.4 Username, Password and Domain

Dial-up networking account information.

8.6.5 Dial-up Automation

1. **Stay Connected after Dial-up**. Stays connected to the remote server after dial-up.
2. **Disconnect after Internet Operation Complete**. Disconnects from the remote server after all internet operations are complete. Note that if you are already connected to the Internet when the dial-up session is opened, Virtual Weather Station will not disconnect from the remote server.

Menu Shortcut: Internet ▶ Network Connection

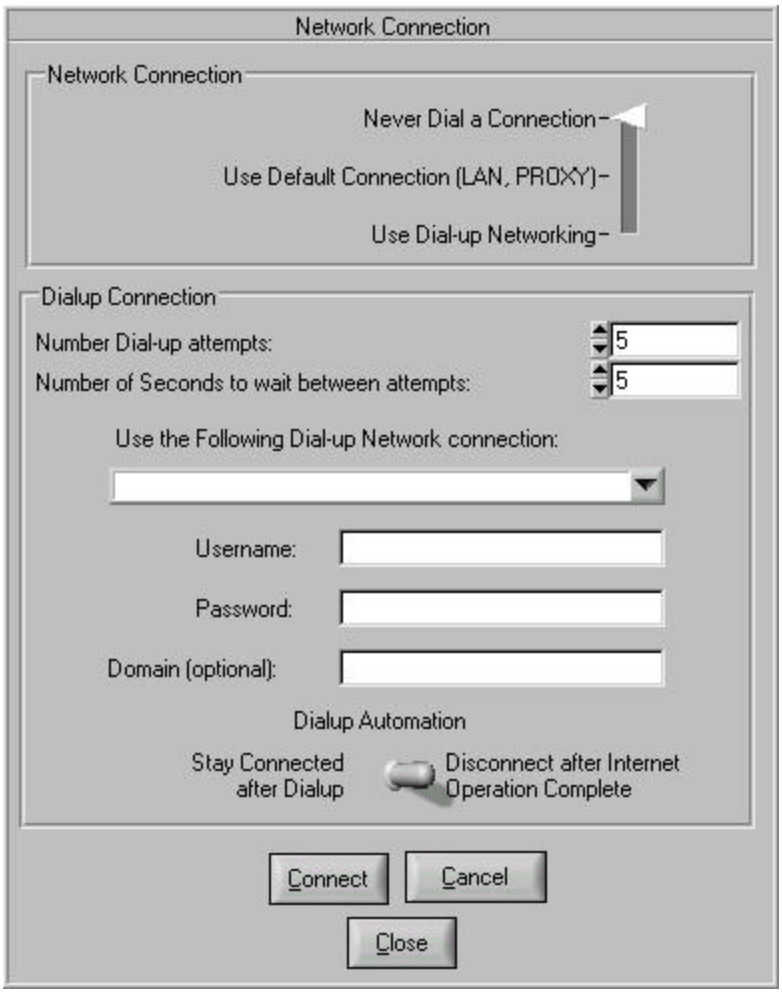


Figure 38 - Networking Connection Setup Panel

8.7 General FTP Settings

The following general FTP Settings allow you to control each FTP session.

8.7.1 FTP Timeout

The timeout period for each FTP operation.

8.7.2 Successive Login Attempts

Number of successive attempts to login to the FTP server.

8.7.3 Maximum Connect Time

The maximum time period to remain connected to the server. This prevents extended connections due to slow internet connections or failed connections.

8.7.4 Time Delay Between Transfers

Some servers can not accept immediate FTP commands. If you commonly receive system socket errors, increase this timer.

8.7.5 Display Connect Timer

Displays the time in seconds that Virtual Weather Station will remain connected to the Internet before timeout.

8.7.6 Max CPU During FTP

To speed up the ftp transfers (which may be important for dial-up applications), VWS resources will automatically increase to the maximum allowable. This feature is particularly useful if FTP transfers timeout.

Menu Shortcut: Internet ▶ Network Connection

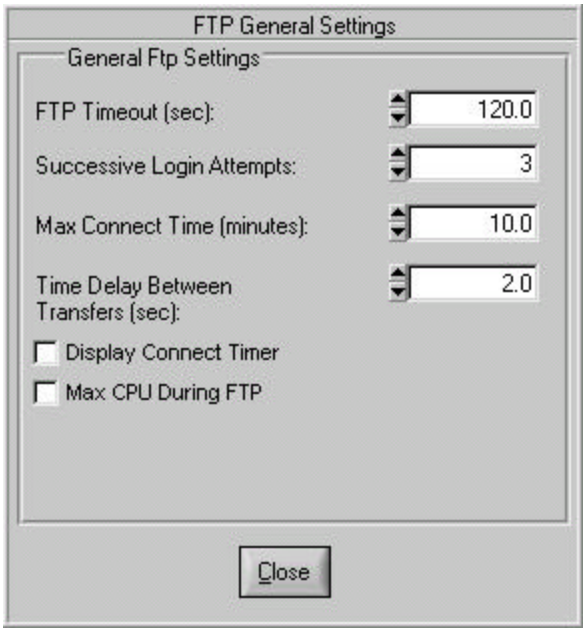


Figure 39 – General FTP Settings

8.8 Virtual Weather Station jpeg Images

When you start Virtual Weather Station for the first time and Virtual Weather Station negotiates communication with your Weather Station, jpeg files are automatically created. The files can be found in c:\vws\root (or the installation directory you specified). The filenames are structured as follows:

vws#.jpg

where # is a unique number designated for a specific gauge, graph or display panel.

The files can be created or updated when you define a display panel.

8.9 Jpeg File Index

The following table provides a complete list of jpg files generated by Virtual Weather Station. Numbers shown are proceeded by vws and followed by .jpg.

For example, the Wind Direction Color Spectrum file is vws001.jpg.

Parameter / Display	Color Spectrum	High/Low	Wind Direction	Thermometer	Gauge	Graph	Alpha Numeric	Moon Phase	Distribution	Strip Chart	Meter	Tank
Wind Direction	001	148	295	442	589	736	883	---	1177	1324	1471	1618
Wind Speed	002	149	---	443	590	737	884	---	1178	1325	1472	1619
Gust	003	150	---	444	591	738	885	---	1179	1326	1473	1620
Indoor Humidity	004	151	---	445	592	739	886	---	1180	1327	1474	1621
Outdoor Humidity	005	152	---	446	593	740	887	---	1181	1328	1475	1622
Indoor Temperature	006	153	---	447	594	741	888	---	1182	1329	1476	1623
Outdoor Temperature	007	154	---	448	595	742	889	---	1183	1330	1477	1624
Barometer	008	155	---	449	596	743	890	---	1184	1331	1478	1625
Total Rain	009	156	---	450	597	744	891	---	1185	1332	1479	1626
Channel 1 Temperature (WMR-968/WMR-918)	010	157	---	451	598	745	892	---	1186	1333	1480	1627
Channel 1 Humidity (WMR-968/WMR-918)	011	158	---	452	599	746	893	---	1187	1334	1481	1628
Channel 2 Temperature (WMR-968/WMR-918)	012	159	---	453	600	747	894	---	1188	1335	1482	1629
Channel 2 Humidity (WMR-968/WMR-918)	013	160	---	454	601	748	895	---	1189	1336	1483	1630
Channel 3 Temperature (WMR-968/WMR-918)	014	161	---	455	602	749	896	---	1190	1337	1484	1631
Channel 3 Humidity (WMR-968/WMR-918)	015	162	---	456	603	750	897	---	1191	1338	1485	1632
Evapotranspiration (Davis only)	016	163	---	457	604	751	898	---	1192	1339	1486	1633
UV Index (Davis only)	017	164	---	458	605	752	899	---	1193	1340	1487	1634
Solar Radiation (Davis only)	018	165	---	459	606	753	900	---	1194	1341	1488	1635
Wind Chill	019	166	---	460	607	754	901	---	1195	1342	1489	1636
Heat Index In	020	167	---	461	608	755	902	---	1196	1343	1490	1637
Heat Index Out	021	168	---	462	609	756	903	---	1197	1344	1491	1638
Dewpoint	022	169	---	463	610	757	904	---	1198	1345	1492	1639
Sea-level Barometer	023	170	---	464	611	758	905	---	1199	1346	1493	1640
Altitude Barometer	---	171	---	465	612	759	906	---	1200	1347	1494	1641

Parameter / Display	Color Spectrum	High/Low	Wind Direction	Thermometer	Gauge	Graph	Alpha Numeric	Moon Phase	Distribution	Strip Chart	Meter	Tank
Cloud Base	---	172	---	466	613	760	907	---	1201	1348	1495	1642
Air Density	---	173	---	467	614	761	908	---	1202	1349	1496	1643
Virtual Temperature	---	174	---	468	615	762	909	---	1203	1350	1497	1644
Vapor Pressure	---	175	---	469	616	763	910	---	1204	1351	1498	1645
Wind Direction Rate	029	176	---	470	617	764	911	---	1205	1352	1499	1646
Wind Speed Rate	030	177	---	471	618	765	912	---	1206	1353	1500	1647
Gust Rate	031	178	---	472	619	766	913	---	1207	1354	1501	1648
Indoor Humidity Rate	032	179	---	473	620	767	914	---	1208	1355	1502	1649
Outdoor Humidity Rate	033	180	---	474	621	768	915	---	1209	1356	1503	1650
Indoor Temperature Rate	034	181	---	475	622	769	916	---	1210	1357	1504	1651
Outdoor Temperature Rate	035	182	---	476	623	770	917	---	1211	1358	1505	1652
Barometer Rate	036	183	---	477	624	771	918	---	1212	1359	1506	1653
Total Rain Rate	037	184	---	478	625	772	919	---	1213	1360	1507	1654
Channel 1 Temperature Rate (WMR-968/WMR-918)	038	185	---	479	626	773	920	---	1214	1361	1508	1655
Channel 1 Humidity Rate (WMR-968/WMR-918)	039	186	---	480	627	774	921	---	1215	1362	1509	1656
Channel 2 Temperature Rate (WMR-968/WMR-918)	040	187	---	481	628	775	922	---	1216	1363	1510	1657
Channel 2 Humidity Rate (WMR-968/WMR-918)	041	188	---	482	629	776	923	---	1217	1364	1511	1658
Channel 3 Temperature Rate (WMR-968/WMR-918)	042	189	---	483	630	777	924	---	1218	1365	1512	1659
Channel 3 Humidity Rate (WMR-968/WMR-918)	043	190	---	484	631	778	925	---	1219	1366	1513	1660
Evapotranspiration Rate (Davis only)	044	191	---	485	632	779	926	---	1220	1367	1514	1661
UV Index Rate (Davis only)	045	192	---	486	633	780	927	---	1221	1368	1515	1662
Solar Radiation Rate (Davis only)	046	193	---	487	634	781	928	---	1222	1369	1516	1663

Parameter / Display	Color Spectrum	High/Low	Wind Direction	Thermometer	Gauge	Graph	Alpha Numeric	Moon Phase	Distribution	Strip Chart	Meter	Tank
Wind Chill Rate	047	194	---	488	635	782	929	---	1223	1370	1517	1664
Heat Index In Rate	048	195	---	489	636	783	930	---	1224	1371	1518	1665
Heat Index Out Rate	049	196	---	490	637	784	931	---	1225	1372	1519	1666
Dewpoint Rate	050	197	---	491	638	785	932	---	1226	1373	1520	1667
Sea-level Barometer Rate	051	198	---	492	639	786	933	---	1227	1374	1521	1668
Wind Direction High	052	199	---	493	640	787	934	---	1228	1375	1522	1669
Wind Speed Average	053	200	---	494	641	788	935	---	1229	1376	1523	1670
Gust Average	054	201	---	495	642	789	936	---	1230	1377	1524	1671
Indoor Humidity Average	055	202	---	496	643	790	937	---	1231	1378	1525	1672
Outdoor Humidity Average	056	203	---	497	644	791	938	---	1232	1379	1526	1673
Indoor Temperature Average	057	204	---	498	645	792	939	---	1233	1380	1527	1674
Outdoor Temperature Average	058	205	---	499	646	793	940	---	1234	1381	1528	1675
Barometer Average	059	206	---	500	647	794	941	---	1235	1382	1529	1676
Total Rain Average	060	207	---	501	648	795	942	---	1236	1383	1530	1677
Channel 1 Temperature Average (WMR-968/WMR-918)	061	208	---	502	649	796	943	---	1237	1384	1531	1678
Channel 1 Humidity Average (WMR-968/WMR-918)	063	209	---	503	650	797	944	---	1238	1385	1532	1679
Channel 2 Temperature Average (WMR-968/WMR-918)	063	210	---	504	651	798	945	---	1239	1386	1533	1680
Channel 2 Humidity Average (WMR-968/WMR-918)	064	211	---	505	652	799	946	---	1240	1387	1534	1681
Channel 3 Temperature Average (WMR-968/WMR-918)	065	212	---	506	653	800	947	---	1241	1388	1535	1682
Channel 3 Humidity Average (WMR-968/WMR-918)	066	213	---	507	654	801	948	---	1242	1389	1536	1683
Evapotranspiration Average (Davis only)	067	214	---	508	655	802	949	---	1243	1390	1537	1684
UV Index Average (Davis only)	068	215	---	509	656	803	950	---	1244	1391	1538	1685
Solar Radiation Average (Davis only)	069	216	---	510	657	804	951	---	1245	1392	1539	1686

Parameter / Display	Color Spectrum	High/Low	Wind Direction	Thermometer	Gauge	Graph	Alpha Numeric	Moon Phase	Distribution	Strip Chart	Meter	Tank
Wind Chill Average	070	217	---	511	658	805	952	---	1246	1393	1540	1687
Heat Index In Average	071	218	---	512	659	806	953	---	1247	1394	1541	1688
Heat Index Out Average	072	219	---	513	660	807	954	---	1248	1395	1542	1689
Dewpoint Average	073	220	---	514	661	808	955	---	1249	1396	1543	1690
Sea-level Barometer Average	074	221	---	515	662	809	956	---	1250	1397	1544	1691
Wind Direction High	---	---	---	---	---	---	---	---	---	---	---	---
Wind Speed High	---	---	---	---	---	---	---	---	---	---	---	---
Gust High	---	---	---	---	---	---	---	---	---	---	---	---
Indoor Humidity High	---	---	---	---	---	---	---	---	---	---	---	---
Outdoor Humidity High	---	---	---	---	---	---	---	---	---	---	---	---
Indoor Temperature High	---	---	---	---	---	---	---	---	---	---	---	---
Outdoor Temperature High	---	---	---	---	---	---	---	---	---	---	---	---
Barometer High	---	---	---	---	---	---	---	---	---	---	---	---
Total Rain High	---	---	---	---	---	---	---	---	---	---	---	---
Channel 1 Temperature High (WMR-968/WMR-918)	---	---	---	---	---	---	---	---	---	---	---	---
Channel 1 Humidity High (WMR-968/WMR-918)	---	---	---	---	---	---	---	---	---	---	---	---
Channel 2 Temperature High (WMR-968/WMR-918)	---	---	---	---	---	---	---	---	---	---	---	---
Channel 2 Humidity High (WMR-968/WMR-918)	---	---	---	---	---	---	---	---	---	---	---	---
Channel 3 Temperature High (WMR-968/WMR-918)	---	---	---	---	---	---	---	---	---	---	---	---
Channel 3 Humidity High (WMR-968/WMR-918)	---	---	---	---	---	---	---	---	---	---	---	---
Evapotranspiration High (Davis only)	---	---	---	---	---	---	---	---	---	---	---	---
UV Index High (Davis only)	---	---	---	---	---	---	---	---	---	---	---	---
Solar Radiation High (Davis only)	---	---	---	---	---	---	---	---	---	---	---	---

Parameter / Display	Color Spectrum	High/Low	Wind Direction	Thermometer	Gauge	Graph	Alpha Numeric	Moon Phase	Distribution	Strip Chart	Meter	Tank
Wind Chill High	---	---	---	---	---	---	975	---	---	---	---	---
Heat Index In High	---	---	---	---	---	---	976	---	---	---	---	---
Heat Index Out High	---	---	---	---	---	---	977	---	---	---	---	---
Dewpoint High	---	---	---	---	---	---	978	---	---	---	---	---
Sea-level Barometer High	---	---	---	---	---	---	979	---	---	---	---	---
Wind Direction Low	---	---	---	---	---	---	980	---	---	---	---	---
Wind Speed Low	---	---	---	---	---	---	981	---	---	---	---	---
Gust Low	---	---	---	---	---	---	982	---	---	---	---	---
Indoor Humidity Low	---	---	---	---	---	---	983	---	---	---	---	---
Outdoor Humidity Low	---	---	---	---	---	---	984	---	---	---	---	---
Indoor Temperature Low	---	---	---	---	---	---	985	---	---	---	---	---
Outdoor Temperature Low	---	---	---	---	---	---	986	---	---	---	---	---
Barometer Low	---	---	---	---	---	---	987	---	---	---	---	---
Total Rain Low	---	---	---	---	---	---	988	---	---	---	---	---
Channel 1 Temperature Low (WMR-968/WMR-918)	---	---	---	---	---	---	989	---	---	---	---	---
Channel 1 Humidity Low (WMR-968/WMR-918)	---	---	---	---	---	---	990	---	---	---	---	---
Channel 2 Temperature Low (WMR-968/WMR-918)	---	---	---	---	---	---	991	---	---	---	---	---
Channel 2 Humidity Low (WMR-968/WMR-918)	---	---	---	---	---	---	992	---	---	---	---	---
Channel 3 Temperature Low (WMR-968/WMR-918)	---	---	---	---	---	---	993	---	---	---	---	---
Channel 3 Humidity Low (WMR-968/WMR-918)	---	---	---	---	---	---	994	---	---	---	---	---
Evapotranspiration Low (Davis only)	---	---	---	---	---	---	995	---	---	---	---	---
UV Index Low (Davis only)	---	---	---	---	---	---	996	---	---	---	---	---
Solar Radiation Low (Davis only)	---	---	---	---	---	---	997	---	---	---	---	---

Parameter / Display	Color Spectrum	High/Low	Wind Direction	Thermometer	Gauge	Graph	Alpha Numeric	Moon Phase	Distribution	Strip Chart	Meter	Tank
Wind Chill Low	---	---	---	---	---	---	998	---	---	---	---	---
Heat Index In Low	---	---	---	---	---	---	999	---	---	---	---	---
Heat Index Out Low	---	---	---	---	---	---	1000	---	---	---	---	---
Dewpoint Low	---	---	---	---	---	---	1001	---	---	---	---	---
Sea-level Barometer Low	---	---	---	---	---	---	1002	---	---	---	---	---
Daily Rain	---	---	---	---	---	---	1003	---	---	---	---	---
Hourly Rain	---	---	---	---	---	---	1004	---	---	---	---	---
Yesterday Rain	---	---	---	---	---	---	1005	---	---	---	---	---
Rain Rate	---	---	---	---	---	---	1006	---	---	---	---	---
Wind Run	---	---	---	---	---	---	1007	---	---	---	---	---
Degree Days Heating	---	---	---	---	---	---	1008	---	---	---	---	---
Degree Days Cooling	---	---	---	---	---	---	1009	---	---	---	---	---
Moon Phase	---	---	---	---	---	---	1010	1151	---	---	---	---
Monthly Rain	---	---	---	---	---	---	1011	---	---	---	---	---
Deg Days Heating Month	---	---	---	---	---	---	1012	---	---	---	---	---
Deg Days Cooling Month	---	---	---	---	---	---	1013	---	---	---	---	---
Wind Run Month	---	---	---	---	---	---	1014	---	---	---	---	---
Deg Days Heating Year	---	---	---	---	---	---	1015	---	---	---	---	---
Deg Days Cooling Year	---	---	---	---	---	---	1016	---	---	---	---	---
Wind Run Year	---	---	---	---	---	---	1017	---	---	---	---	---
Heat Stress	---	---	---	---	---	---	1018	---	---	---	---	---
Comfort Level	---	---	---	---	---	---	1019	---	---	---	---	---
Forecast	---	---	---	---	---	---	1020	---	---	---	---	---
Barom Trend	---	---	---	---	---	---	1021	---	---	---	---	---
Pressure Trend	---	---	---	---	---	---	1022	---	---	---	---	---
Beaufort Scale	---	---	---	---	---	---	1023	---	---	---	---	---

Parameter / Display	Color Spectrum	High/Low	Wind Direction	Thermometer	Gauge	Graph	Alpha Numeric	Moon Phase	Distribution	Strip Chart	Meter	Tank
Date	---	---	---	---	---	---	1024	---	---	---	---	---
Time	---	---	---	---	---	---	1025	---	---	---	---	---
Sunrise	---	---	---	---	---	---	1026	---	---	---	---	---
Sunset	---	---	---	---	---	---	1027	---	---	---	---	---
Moonrise	---	---	---	---	---	---	1028	---	---	---	---	---
Moonset	---	---	---	---	---	---	1029	---	---	---	---	---

Table 8– Jpg Display Settings File Index Numbers

8.10 Other Jpeg Filenames

In addition to the jpg filenames in the previous section, the following filenames describe other jpg files created from the desktop weather images.

Description	Filename
Broadcast Panel Display	broadcast.jpg
Icon Display	icon.jpg
METAR Icons	icon1.jpg thru icon30.jpg

Table 9– Other Jpg Filenames

8.11 Intranet and Local Area Network Applications

If your computer is on a Local Area Network or an Intranet, both the ftp and web server options will work.

Virtual Weather Station provides another method, which is direct jpg file transfer. This does not require use of ftp or web server technology. Select the Jpeg Direct File Transfer option. The files will be transferred to the Jpeg file location specified in the panel.

8.12 Web Page Templates

Your software was shipped with several HTML templates. To view these templates, select Weather Website Builder from the Help Menu, and select one of the Web Page Templates.

8.13 Creating Web Pages with Virtual Weather Station Tags

➧ NOTE: It is highly recommended you start with the html templates provided with Virtual Weather Station and edit these files to familiarize yourself with this feature. Run the Weather Website Builder provided under the help menu, and then explore the file templates and HTML files generated from the templates.

8.13.1 Description of HTML Tags

HTML Tags allow you to insert weather station data text into your web page. Virtual Weather Station accomplishes this by searching for a known "Tag" in a "Template" file, replacing the tag with weather data, and copying the template to an HTML file. The steps are provided in the following sections.

8.13.2 Creating an HTML Template File (htx file)

HTX files or HTML template files can be created with most Web Page authoring tools. Microsoft Frontpage is one of several commercially available web authoring packages, and there are several shareware software packages available.

To create a template file, save the template with an htx file extension with any text editor or web authoring tool.

8.13.3 Inserting HTML Tags Into the Templates

There are three types of File Tags:

1. Each weather parameter has a unique file tag. For example, the file tag for the outdoor temperature can be inserted into your web page template as follows:

   Outside Temperature: ^vxv007^°F

   where the vxv006 is the HTML tag for outdoor temperature and ^ is the parsing character.

2. METAR data that you download has a unique file tag. For example:

   Los Angeles International Airport (KLAX) Temperature: ^mtr004KLAX^°F

   where the mtr004 is the METAR tag for outdoor temperature, KLAX is the METAR designator for Los Angeles International Airport, and ^ is the parsing character.

3. File Tags. You can specify the path of any file specified on the File Tags list. For example:

   ^c:\vws\data\daily.txt^

   where c:\vws\data\daily.txt is the complete file path and ^ is the parsing character. For more information for adding a file path to the tag list, reference Section 8.14, HTML File Tags.

To view a complete list of the HTML tags, reference Figure 40 - HTML Tags. The HTML Tags window allows you to easily cut and paste HTML tags into the template file.

To select and copy a Tag to the clipboard, double click on the selected parameter in the list. Next, paste the Tag into your HTML template.

Menu Shortcut: Internet ▶ HTML Tags

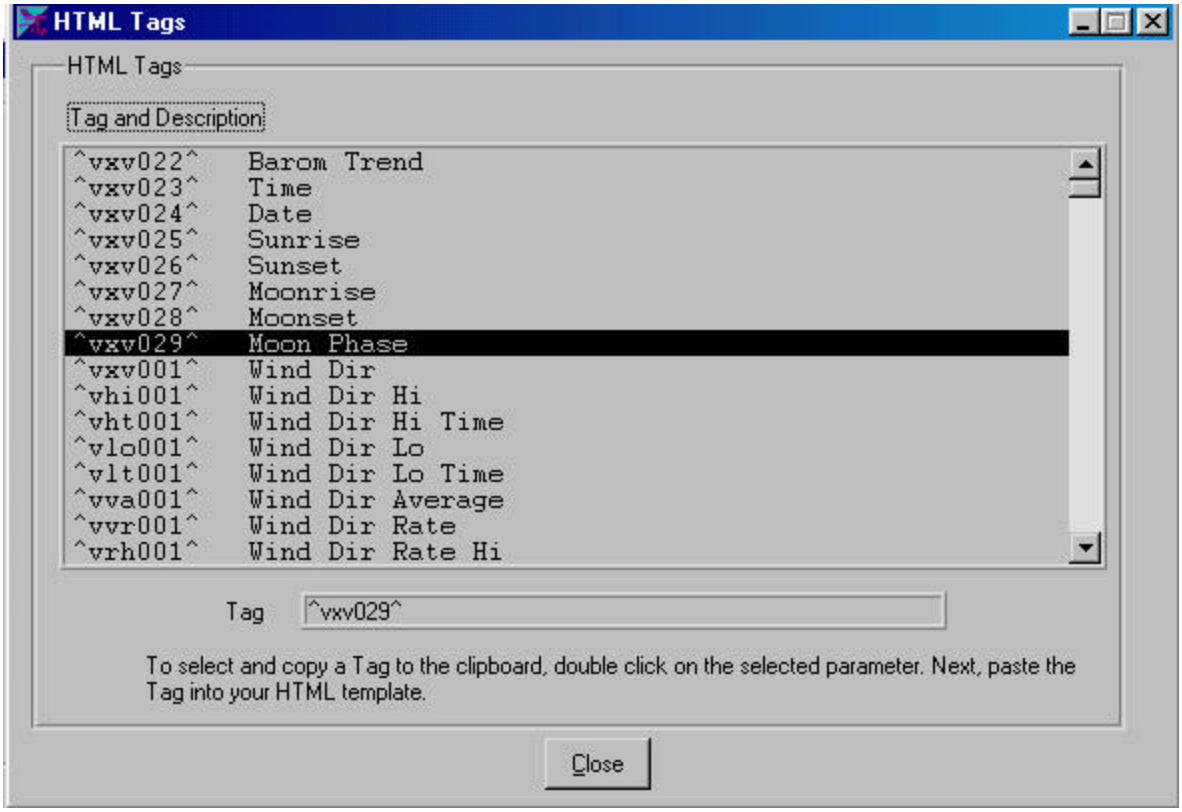


Figure 40 - HTML Tags

The following table provides an index of tag names:

Tag Name	Description
^**vxv**###^	**vxv** = Virtual Weather value, ### designates weather parameter number. Example: ^vxv006^
^**vhi**###^	**vhi** = Virtual Weather Daily High
^**vht**###^	**vht** = Virtual Weather Daily High Time
^**vlo**###^	**vlo** = Virtual Weather Daily Low

Tag Name	Description
^**vlt**###^	**vlt** = Virtual Weather Daily Low Time
^**vva**###^	**vva** = Virtual Weather Average Value
^**vvr**###^	**vvr** = Virtual Weather Rate
^**vrh**###^	**vrh** = Virtual Weather Rate High
^**vrt**###^	**vrt** = Virtual Weather Rate High Time
^**vrl**###^	**vrl** = Virtual Weather Rate Low
^**vrs**###^	**vrs** = Virtual Weather Rate Low Time
^mtr###ABCD^	**ABCD** = METAR identifier, ### specifies the parameter number. Example: ^mtrKLAX006^
^vervws^	Virtual Weather Station Version Number

Table 10 – Index of HTML Tag Names

Reference Figure 41: Example HTML Template with is an example of an HTML template with HTML Tags inserted.

Detailed Weather Conditions

Virtual Weather Station Version ^vervws^

Current Conditions

Last Updated: ^vst143^ on ^vst142^
Outside Temperature: ^vxv007^°F
Today's High: ^vhi007^°F at ^vht007^
Lo: ^vlo007^°F at ^vlt007^
Barometric Trend: ^vvr008^

Sunrise : ^vst144^ Sunset: ^vst145^

Moonrise: ^vst146^ Moonset: ^vst147^

Moon Phase: ^vxv128^

Figure 41: Example HTML Template with HTML Tags

8.13.4 Creating the HTML File from the HTML Template (htx) File

Reference Figure 42 - Creating Web Pages with Virtual Weather Station Tags.

To view HTML settings, select **[Internet][HTML Settings]** from the taskbar. This panel specifies the template file location and the Web Page or HTML Filename. The following settings are available:

- **Update HTML Timer**. Specifies how often to update the HTML panels.
- **On**. Activates the parsing and saving of the html file
- **Template File**. HTML template file (htx) contains the HTML tags
- **HTML Filename**. File created by the template file.
- **Browse**. Browse to the location of the file(s)
- **Preview**. Previews the Web Page in your default browser.

To create the "finished" HTML file from the template,

- Select one of the check boxes **ON**
- **Browse** to the template file you created (left column of files)
- **Browse** to define the final location of the HTML file (right column of files)
- Select the **UPDATE** button

- Select the **Preview** Button to view the finished HTML file
- To automatically update this process, select an **HTML File Update Timer**.
- To upload the finished file to the Internet, select the **Upload Files to Internet** button and Browse to the HTML file location created.

Menu Shortcut: Internet ▶ HTML Settings

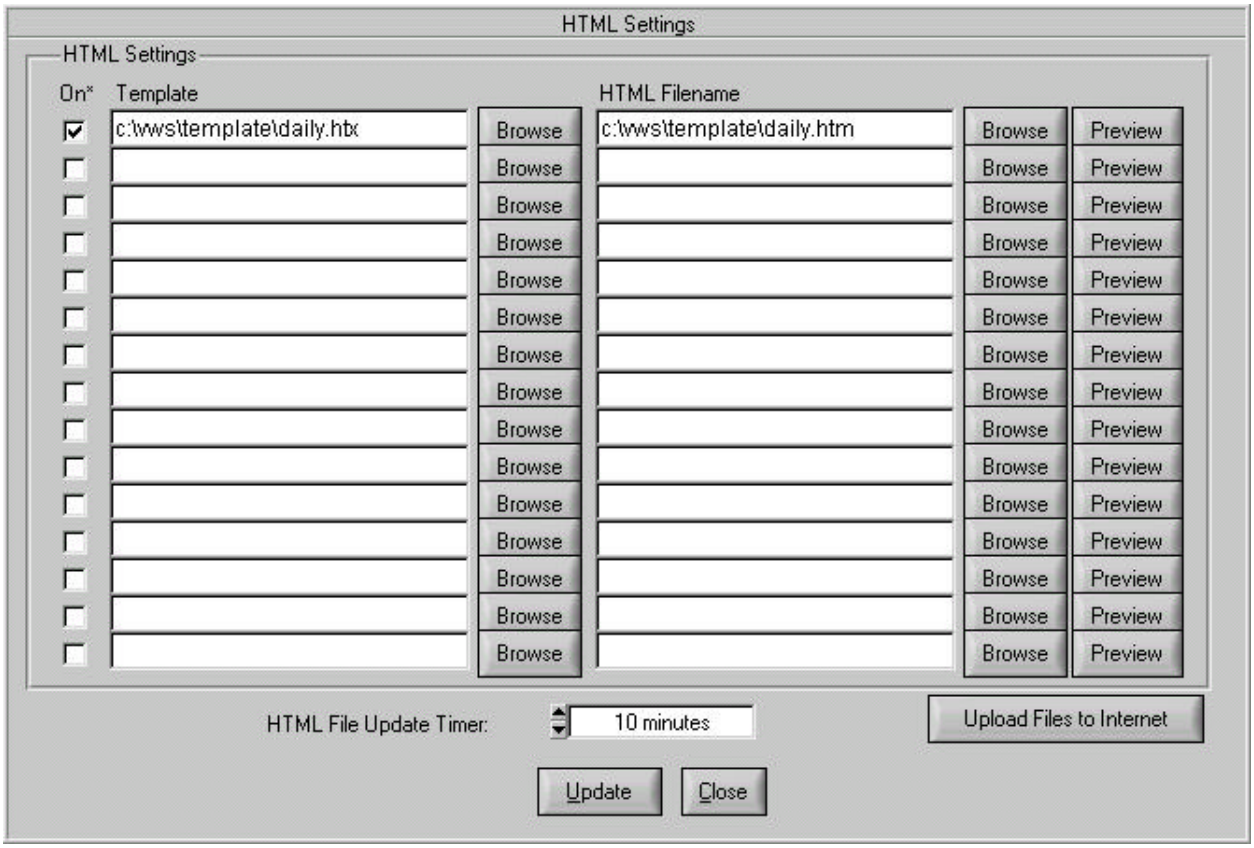


Figure 42 - Creating Web Pages with Virtual Weather Station Tags

8.14 HTML File Tags

File tags can be inserted into the HTML template (hx) to display data from a text file directly in your web page.

Reference Figure 43 - File Tags. To specify a file HTML tag, browse to a file located on your local network.

Once entered, the file will be listed in the HTML Tags window (reference Figure 40 - HTML Tags).

For example, the tag for the daily text file generated by Virtual Weather Station is as follows:

^c:\vws\data\daily.txt^

This tag can be directly cut and paste into your web page, and the entire file is displayed in the same font size, color and format.

Files can be downloaded from the Internet, and then displayed in your web pages. This is particularly useful for displaying forecasts and climate data generated by the NOAA and available on the NOAA weather server.

Menu Shortcut: Internet ▶ HTML File Tags

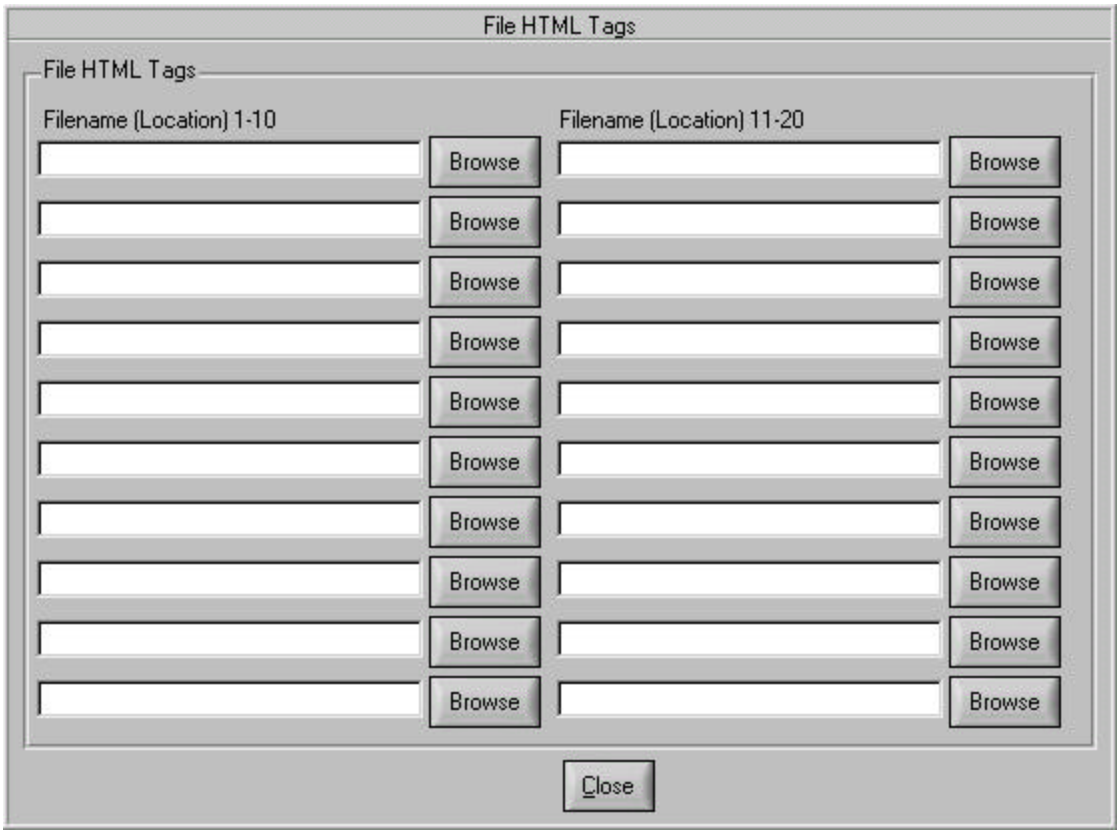


Figure 43 - File Tags

8.15 Ftp Operation

The File Transfer Protocol (FTP) is part of the TCP/IP protocols for data transmission on the Internet and is used mainly to transfer files between computers. FTP is a client-server protocol in which an FTP server waits for FTP clients to connect to the server and issue requests.

Generally, FTP servers require clients to provide a username and password before processing any requests. An FTP server administrator determines the user access policy for the server. Many FTP servers allow anonymous access, with restrictions, to the server. To log onto an FTP server anonymously, clients enter anonymous as the username and their e-mail address as the password.

Virtual Weather Station provides FTP Client functions that connect to, and perform operations on, a specified FTP server. Virtual Weather Station does not provide functions that let your program behave as an FTP server. When your program calls the FTP Client functions, it connects to an FTP server which typically is running on a remote computer.

8.15.1 Connecting to Your Remote Ftp Server

Verify you can connect to your Ftp Server. Select [Internet][Login] from the menubar.

Menu Shortcut: Internet ▶ FTP Login

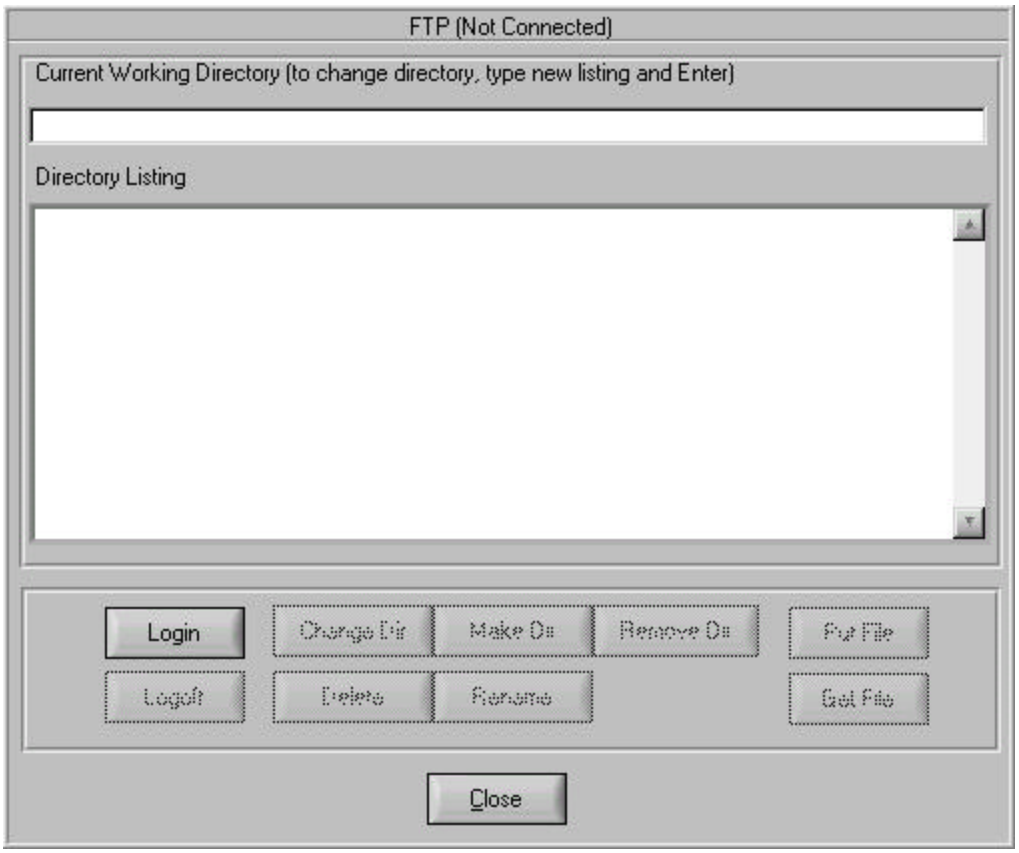


Figure 44 - Ftp Sever Panel

Enter the following information:

1. Server Name (for example, ftp-www.earthlink.net)
2. User Name
3. Password

Select [OK].

The initial directory is optional.

Menu Shortcut: Internet ▶ FTP Login [Login]

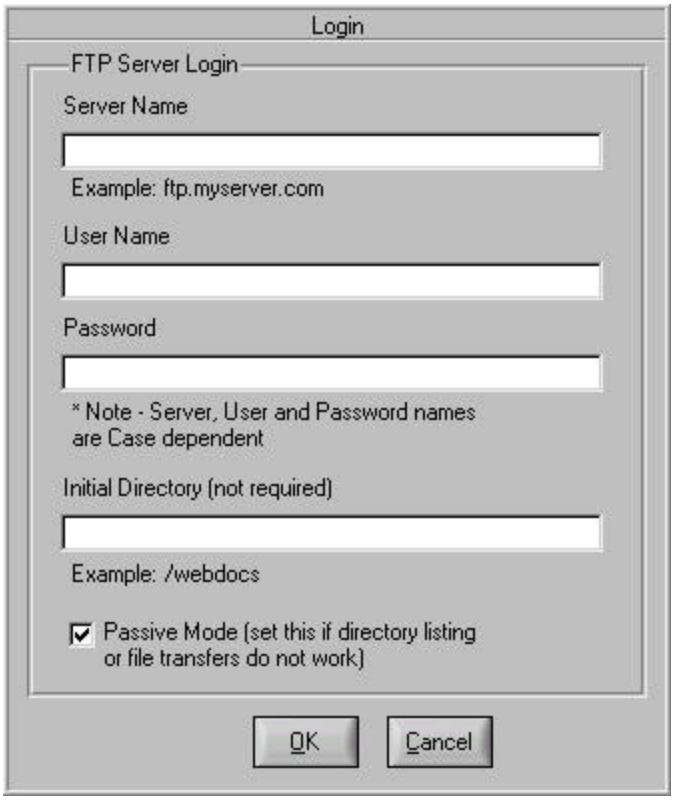


Figure 45 - Ftp Login Panel

This information will be permanently saved for automatically transferring files from your PC to your Web Server.

You should now see your default working directory (for example, \webdocs) and associated files.

You can now ftp the html template files provided with this software to your remote server. You must also transfer the associated jpg files to the remote server. Now is a good time to use the automated FTP features to transfer the jpg files.

If you are not able to see the directory listing, select the passive mode. Some servers operate in the passive mode and do not require commands for listing directories.

Close the Ftp Server Panel.

8.15.2 Automatic Ftp Features

Virtual Weather Station allows you to automatically transfer files from your PC to the Internet and from the Internet to your PC. There are three categories of FTP operation described in the following sections.

8.15.2.1 Sending Jpeg Files Displayed in Virtual Weather Station Desktop to the Internet (Jpeg FTP Settings)

For each element on your desktop, a jpeg image is generated. The files are sent to the created and sent to the Internet at the same time based on a schedule.

Reference Figure 46 - Jpeg FTP Settings. The following sections describe the jpeg FTP settings.

8.15.2.1.1 Creating Temporary Jpg Files First On the Server

Broken links can occur if a web surfer views your web page while a file is in the process of uploading. To avoid these broken links, select the **Create Temporary File First on the Server**. This option creates a file tempfilename.jpg, and then copies tempfilename.jpg to filename.jpg. The process of renaming a file on the server takes much less time than transferring the file to your server, avoiding the broken links.

8.15.2.1.2 Send Files to this Location on Server

Browse to your server location to specify the location the jpeg files will be sent.

Menu Shortcut: Internet ▶ Jpeg FTP Settings

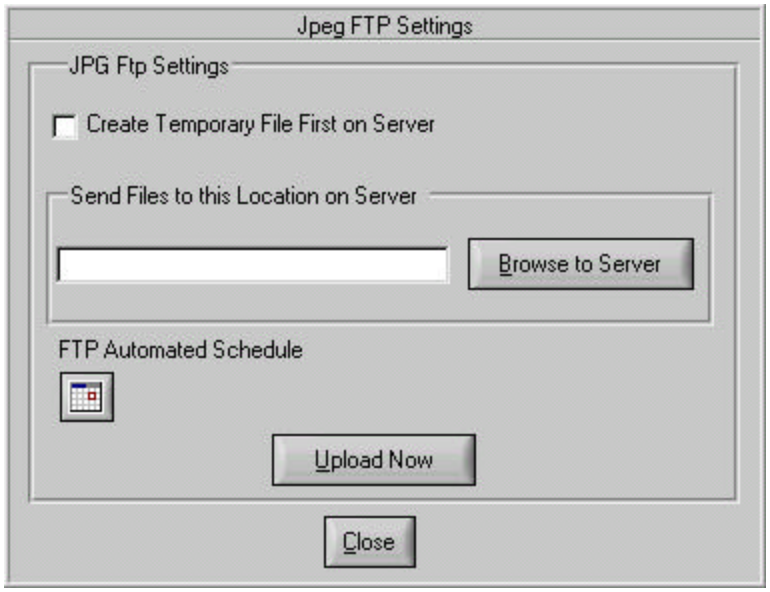


Figure 46 - Jpeg FTP Settings

8.15.2.2 Sending (Upload) User Selectable Files to the Internet (FTP Server)

Virtual Weather Station allows you to send up to 20 files to your remote Ftp server automatically. You can send any file, such as weather cam images or HTML files generated from the HTML templates.

Reference Figure 47 - Sending Files to the Internet (FTP server).

Menu Shortcut: Internet ▶ FTP File Send (Upload)

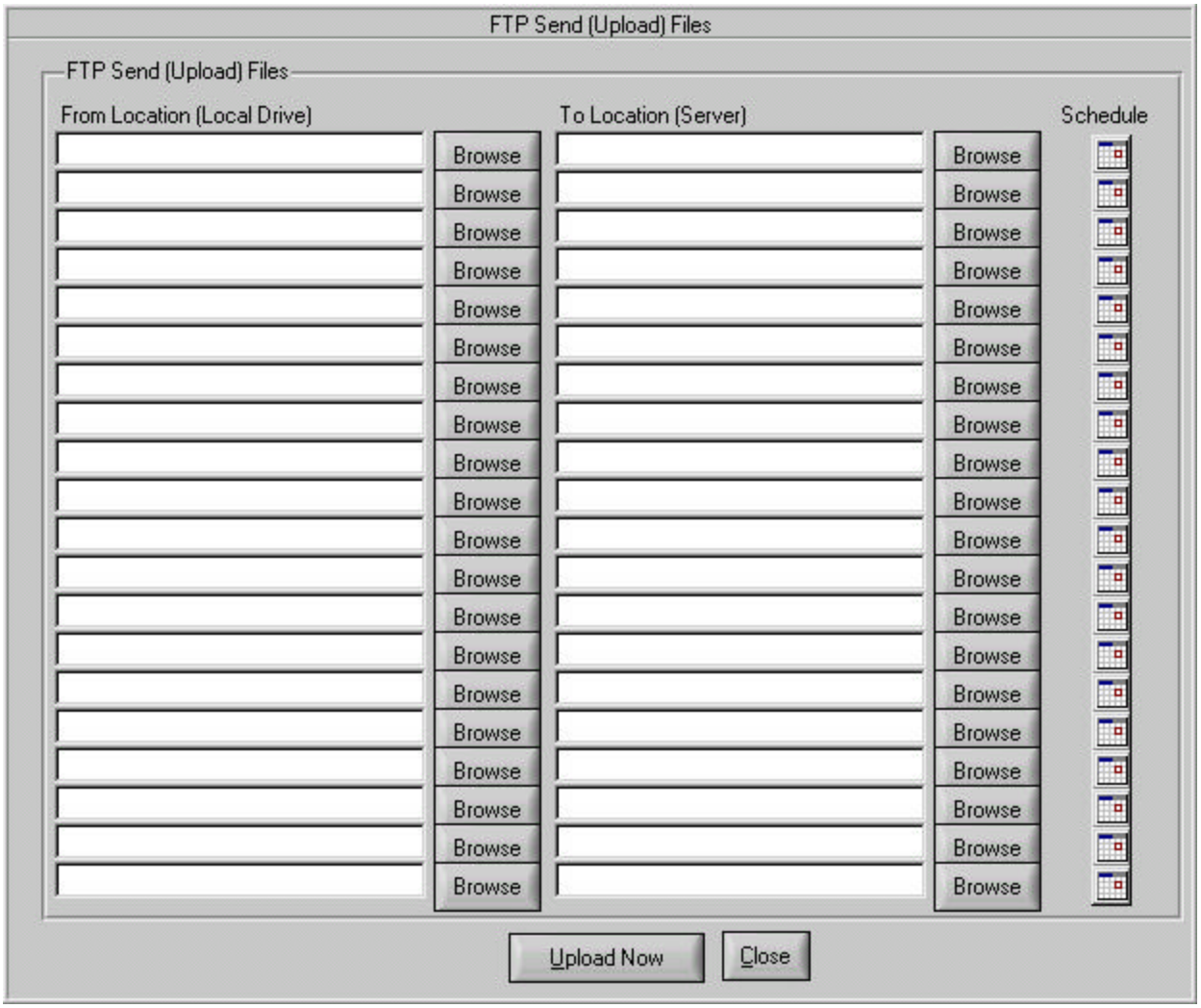


Figure 47 - Sending Files to the Internet (FTP server)

8.15.2.3 Retrieve (Download) Files from the Internet

Files can be automatically downloaded from the Internet based on a schedule. The files include any public file addressable from the Internet.

The files are saved on your local drive and can be used for display in your web pages using file tags (see the section on File Tags for more details).

FTP (ftp://) or HTTP (http://) files can be downloaded.

Menu Shortcut: Internet ▶ FTP File Receive (Download)

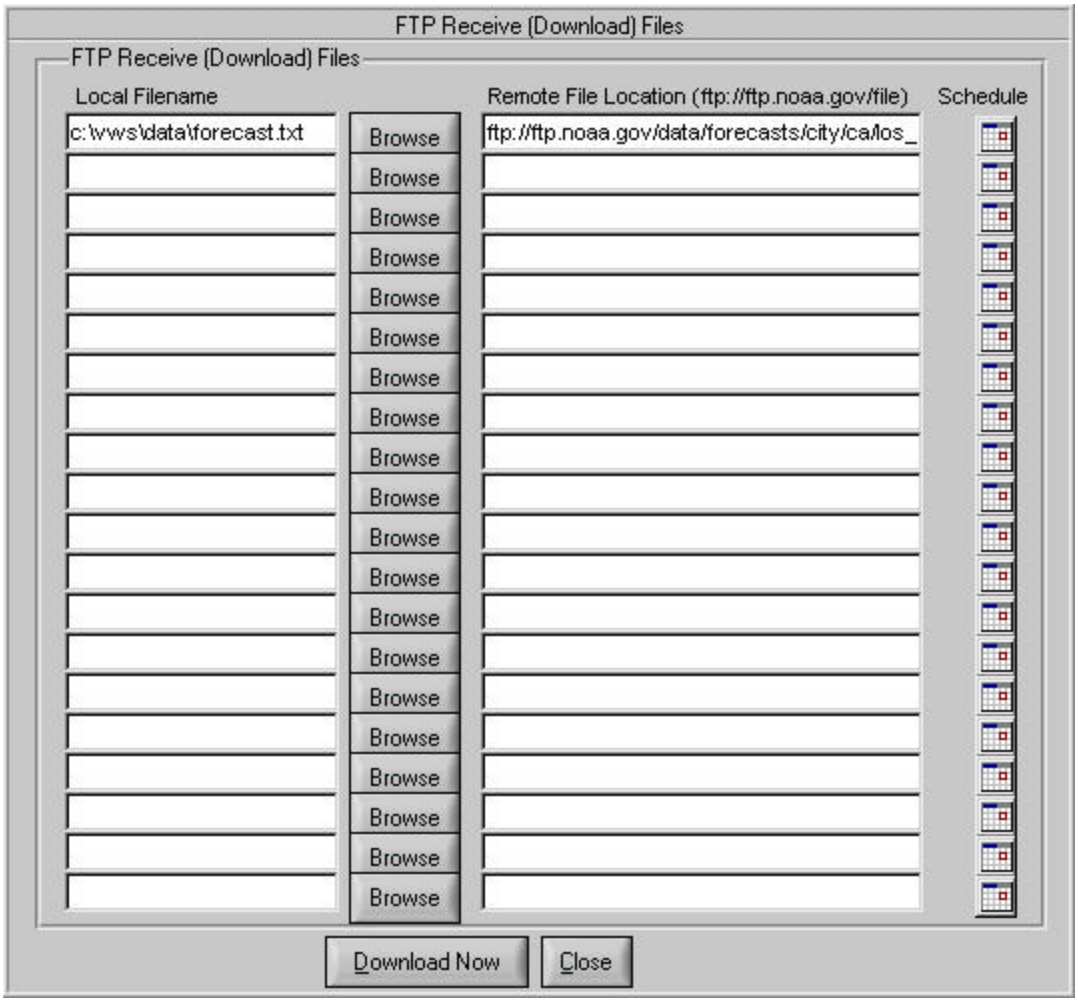


Figure 48 - Downloading Files from the Internet

8.16 E Mail Weather Reports and Alarming

Virtual Weather Station allows you to automatically or manually send Internet e-mail messages. Your Web server must send the message through a server that supports the Simple Mail Transfer Protocol (SMTP) protocol. SMTP is the standard Internet mail transfer protocol. Ask your network administrator for the name of a computer that your server can use as an SMTP server.

The parameters specify the SMTP server, sender, recipient, subject, message body, and file attachments of the message. The file attachments can include any text or binary files. The SMTP standard does not require a user name and password.

To get started, identify your E Mail server name (for example, mail.earthlink.net), and send an alarm to yourself.

8.16.1 Email Settings

Virtual Weather Station allows you to send E Mail messages and attachments when alarm limits are exceeded. You can also send periodic weather reports. To view the E Mail settings, select [Settings][Email] from the menubar.

Enter the following information:

4. E-Mail (SMTP) Server. This is the name of the server established by your network administrator. An example SMTP server is mail.earthlink.net.

5. To: Recipient of your E Mail message. An example is support@weatherconnect.com. Separate Email addresses by semicolons. For example, if you are addressing the Email message to two addresses (example):

   support@weatherconnect.com;support@ambientsw.com

6. From: Sender of E Mail message.

7. Title: Title of the E Mail message.

8. Text Message. If you want to include an optional text message, enter the message in the text box.

9. Attachments. Send attached weather data files.

Menu Shortcut: Internet ▶ Email Settings

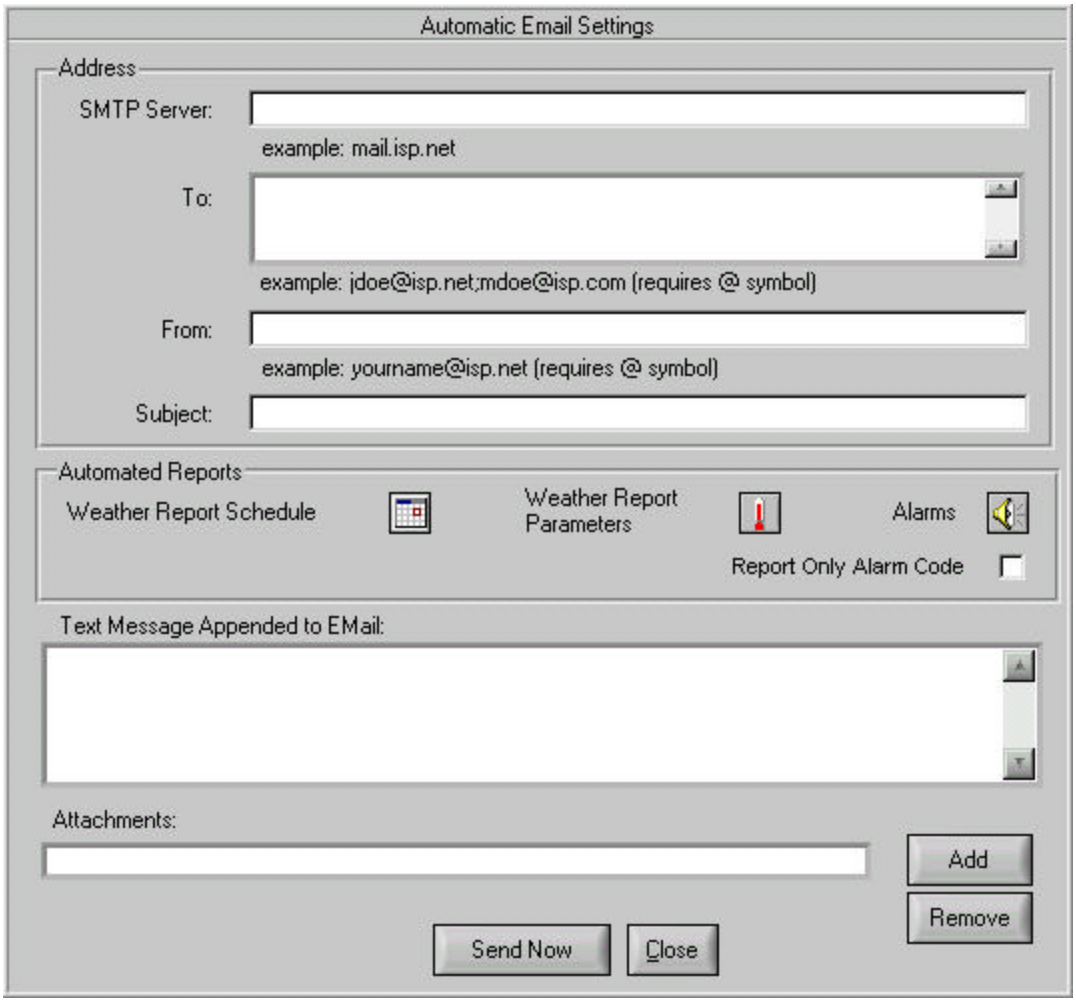


Figure 49: Automatic E Mail Settings

8.16.2 Weather Reports

Periodic weather reports can be sent based complex user defined schedule. To view the schedule, select the calender from the panel.

The weather report sends the parameters specified in the File Settings Panel. To view, this panel, select the parameter icon from the panel. The names and units are based on the entries, providing foreign language support.

The weather report data is appended to the Email message specified in the Email panel.

8.16.3 Email Alarms

Email alarms can be sent based on alarm conditions. *See Alarms* for more information. To view the alarms panel, select the Alarm icon from the display panel.

8.16.4 Reporting Alarm Codes Only

Instead of sending a message, a simple fault code can be sent. This is important for Email pagers where message length and bandwidth are important.

Referencing the Email alarm panel, if condition 1 is met, the fault code “1” will be sent. If conditions 1 and 2 are met, the fault code “12” will be sent.

8.17 METAR

8.17.1 General Description

Beginning 1 July 1996, the United States undertook the most significant change for observing, reporting, and coding surface weather observations and terminal forecasts in the past forty years. Not since the early 1950s, when the present airways code (commonly known as Surface Aviation Observation or SA code), and Terminal Forecast (FT) codes were adopted, has there been such a major code change for weather observations and forecasts.

On 1 July 1996, the international standard code for hourly and special surface weather observations, METAR/SPECI, took effect.

The METAR acronym roughly translates from the French as *Aviation Routine Weather Report* . A special report, SPECI, is merely a METAR formatted report which is issued on a non-routine basis as dictated by changing meteorological conditions.

The SPECI acronym roughly translates as *Aviation Selected Special Weather Report* . Meanwhile, the international standard code format for terminal forecasts issued for airports, TAF , also took effect. The acronym translates to *Aerodrome Forecast* .

The Federal Aviation Administration (FAA), which determines aviation requirements in the United States, has determined that the domestic transition to the METAR/TAF code is vital to the standardization of these reports worldwide. The National Weather Service (NWS) and Department of Defense (DOD) are complying with this requirement.

The benefits of having the U.S. standardize to these new code formats are as follows. Hourly and special observations are used both as stand alone data for the sites and as inputs to global weather models for both analysis and forecasting. It is this global use of each small bit of information which drives the need for standardization.

Additionally, the increase in international flights between the U.S. and other nations from more U.S. locations than ever before lends itself to developing a more "seamless" international standard for aviation. Moreover, standardization becomes vital for the general aviation community for flights from the U.S. to Canada, the Caribbean Area, and Mexico.

8.17.2 Finding METAR Reports

METAR reports worldwide can be found at the NOAA anonymous ftp server in the following text file formats:

Individual Decoded Reports ftp://weather.noaa.gov/data/observations/metar/decoded/

Individual Coded Reports

8.17.3 Locating a Station Near You

The NOAA provides a convenient map for locating a METAR station near your. Click on the following link to go to the map:

http://www.faa.gov/asos/map/map.htm

8.17.4 METAR Station Setup

Reference Figure 50 – METAR Station Setup.

To display METAR data on your desktop and generate a history based on METAR reporting stations, select **Add New Station to List**.

Each METAR station requires an identifier. To find a list of identifiers, select one of the following buttons:

View Worldwide Station List. Provides a list of stations around the world

View USA Station Map. Find a station near you in the USA.

View Independent Station List. Provides a list of independent station owners (like yourself). You can join the network of independent station owners by following the instructions at www.weatherforyou.com.

Menu Shortcut: METAR ▶ Station Setup

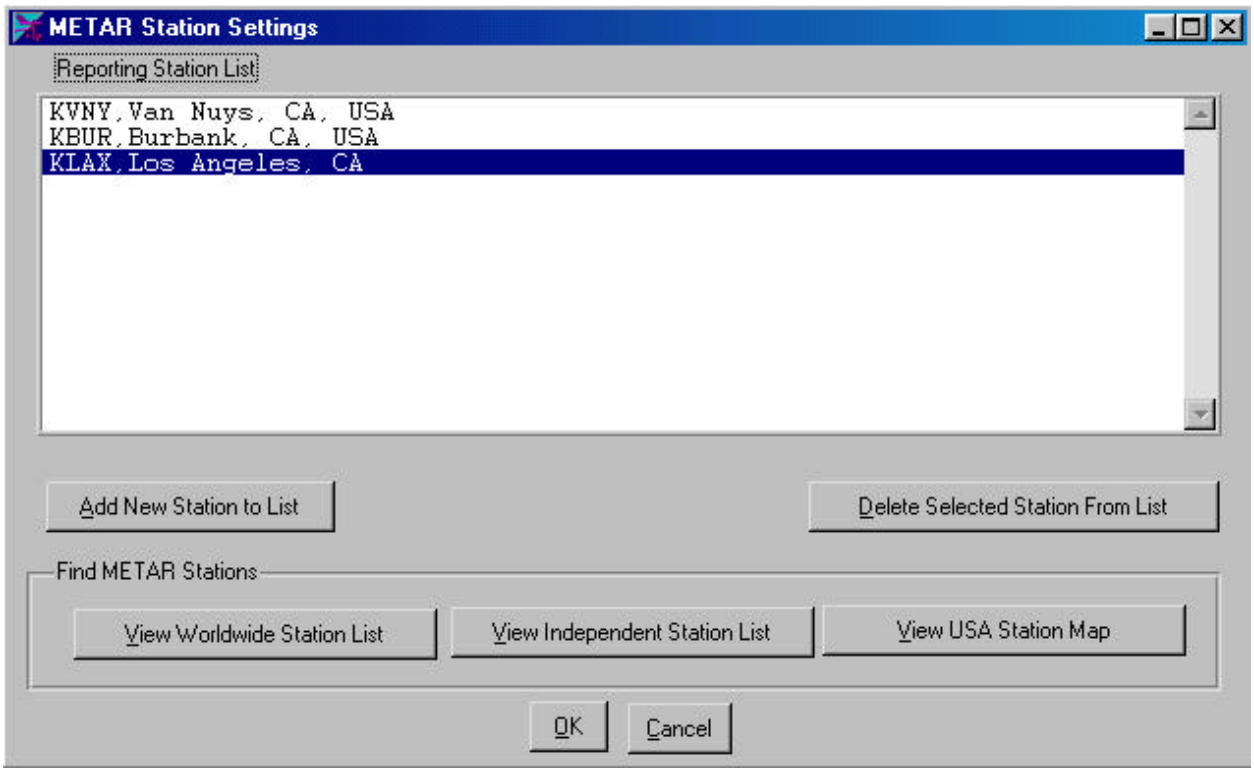


Figure 50 – METAR Station Setup

8.17.5 Displaying METAR Icons on the Desktop

Figure 51 – METAR Icon

After you have selected a specific METAR station for download, you can display this data on your desktop.

Reference Figure 52 – METAR Icon Display Settings. Enter the Site identifier and the title your wish to display on your desktop.

To display the icon, check the Display Checkbox. Create a jpg file if you wish to display the image on your website. The files are named icon1.jpg to icon30.jpg based on the display number.

The jpg images are saved in the same file location as the other desktop images unless you specify a different directory on the panel.

The icon background changes from day to night based on your local sunset time. To adjust the day and nighttime text color, select the color boxes.

Menu Shortcut: Modify Display ▶ METAR Icons

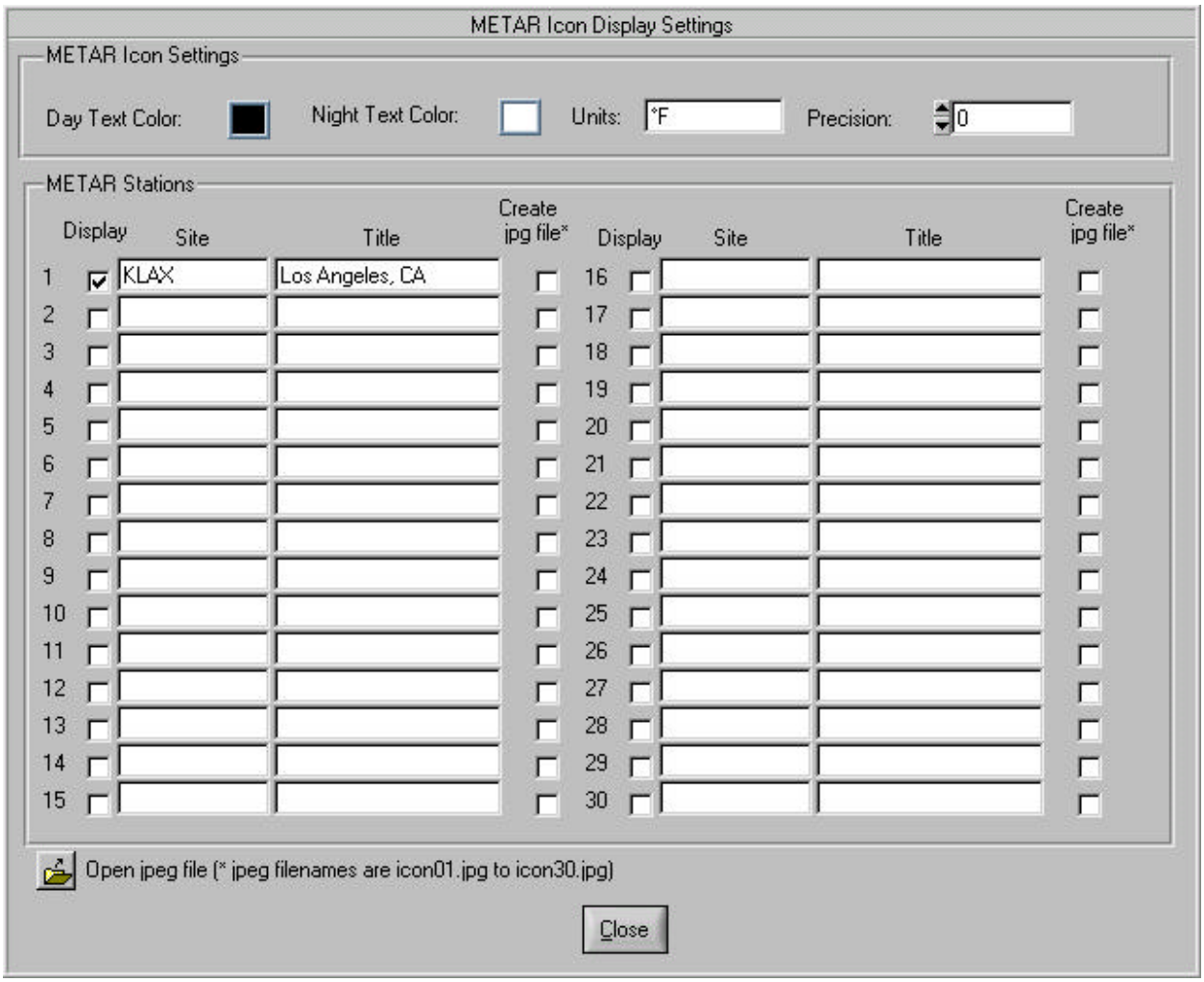


Figure 52 – METAR Icon Display Settings

8.17.6 METAR Settings

To define METAR settings, select [Modify Display][METAR Icons] from the Menubar.

The following METAR settings are adjustable.

Parameter	Description
Auto Update METAR Active	This checkbox must be selected to automatically fetch METAR data from the server
Create METAR File	Creates a METAR text file summary report
Schedule	A schedule must be defined to automatically update METAR data

Parameter	Description
Distance Units	METAR cloud height and visibility is expressed in km or kft and miles
Server	There are two servers to obtain data. The NOAA server is the official government server, but is slow and does not include private weather station owners. The HamWeather Server is a mirror server, is much faster, and provides access to the network of personal weather station owners data

Table 11 – METAR Settings

Menu Shortcut: Modify Display ▶ METAR Icons

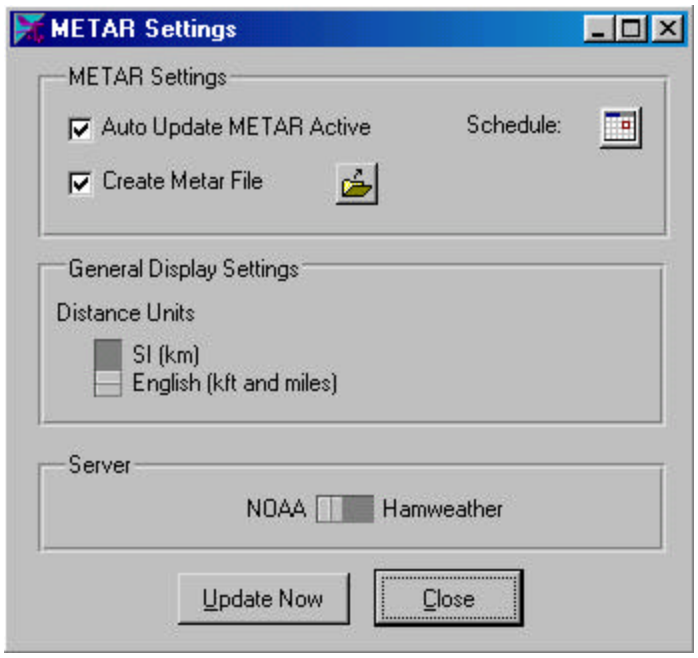


Figure 53 – METAR Icon Settings

8.17.7 METAR Report Generator

Since METAR is the reporting standard for weather observations, VWS generates METAR reports so you can share weather data. VWS also includes an interpreter, so you can interpret other METAR reports. The main reason users put their information on the internet is to share data. VWS provides a conduit for sharing weather information.

Menu Shortcut: METAR ▶ METAR Generator

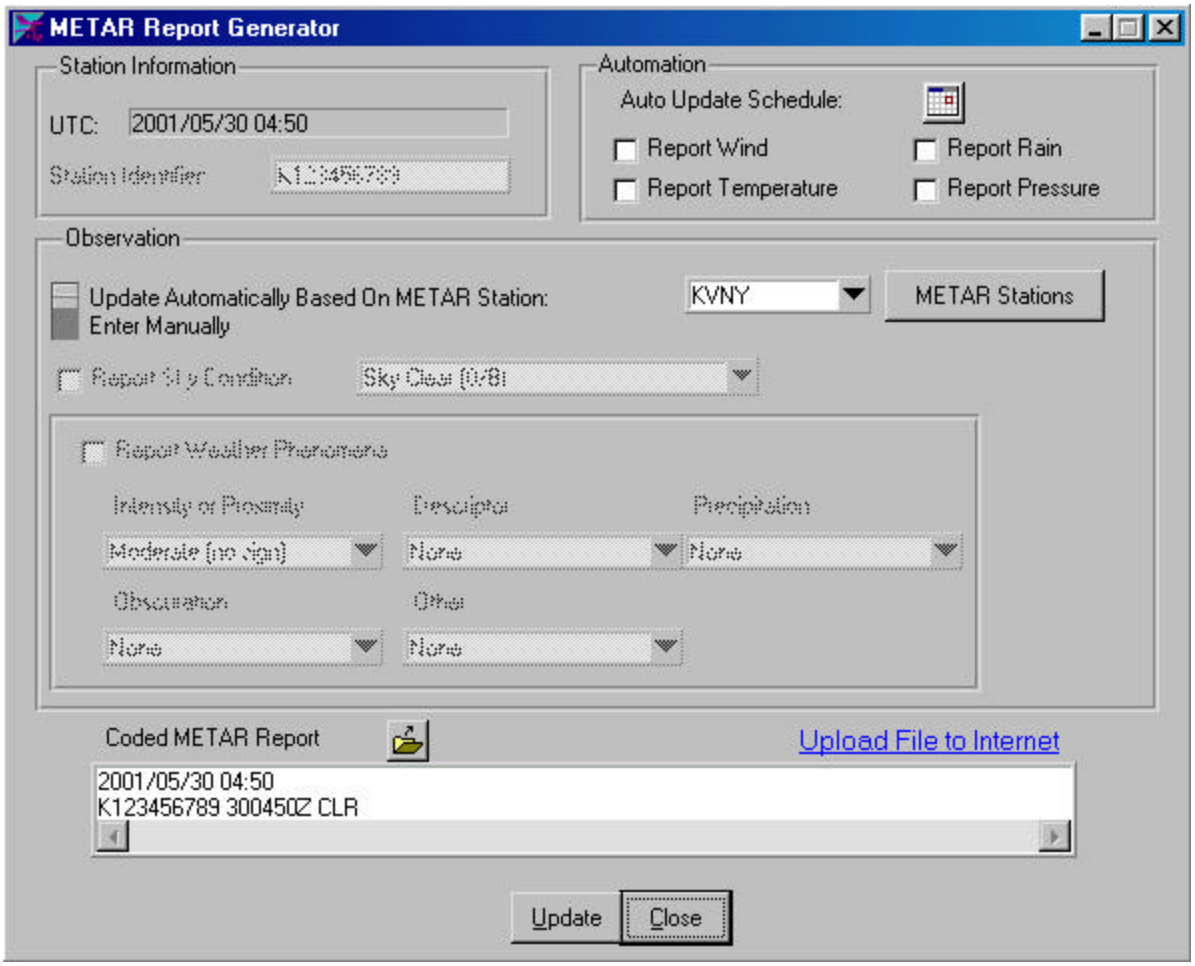


Figure 54 – METAR Report Generator

8.17.8 METAR Text Reports

Three text reports are available from METAR generated data. The following section describes the METAR reports and locations.

8.17.8.1 METAR Summary Text Report

The METAR summary text reports are located in the following file location:

\data\metar.txt

Location	Last Update Date and Time	Temp °F	Dew °F	HtIx °F	Chill °F	%Rh %	Press in	Rain in	Wind Dir	Wind Spd	Wind Gust	Visib miles	Cloud kft	Sky/Weather
Van Nuys	05/29/2001 09:51pm	66	61	71	66	83	29.91	---	ESE	4	4	10	---	Clear/
Burbank	05/29/2001 08:53pm	68	55	70	63	64	29.90	---	ESE	9	9	10	---	Clear/
Los Angeles	05/29/2001 09:50pm	63	59	68	60	88	29.92	---	WSW	6	6	9	---	Clear/

Figure 55 – METAR Summary Reports

8.17.8.2 METAR Historical Text Report

The METAR historical text reports are located in the following file location:

\data\KABC.txt

where KABC is the METAR identifier

Date / Time	Temp °F	Dew °F	HtIx °F	Chill °F	%Rh %	Press in	Rain in	Wind Dir	Wind Spd	Wind Gust	Visib miles	Cloud kft	Sky/Weather ---/---
03/31/2001 12:50pm	64.4	57	68.3	57	77	29.99	---	---	11	11	3	2.0	Overcast/ Haze
03/31/2001 01:50pm	64.4	57	68.3	57	77	29.97	---	WSW	12	12	3	2.0	Broken Clouds/ Haze
03/31/2001 01:50pm	64.4	57	68.3	57	77	29.97	---	---	12	12	3	2.0	Broken Clouds/ Haze
03/31/2001 02:50pm	62.6	57	67.2	55	83	29.95	---	WSW	11	11	4	2.0	Broken Clouds/ Haze
03/31/2001 03:26pm	62.6	57	67.2	55	83	29.94	---	WSW	12	12	4	1.1	Broken Clouds/ Haze
03/31/2001 03:26pm	62.6	57	67.2	55	83	29.94	---	---	12	12	4	1.1	Broken Clouds/ Haze
03/31/2001 03:50pm	60.8	57	66.1	52	88	29.94	---	WSW	12	12	4	1.1	Overcast/ Mist
03/31/2001 04:07pm	60.8	55	65.4	52	82	29.93	---	WSW	12	12	3	1.1	Overcast/ Mist
03/31/2001 04:50pm	59.0	55	64.3	51	88	29.93	---	WSW	10	10	0.50	0.9	Overcast/ Mist
03/31/2001 05:50pm	59.0	55	64.3	51	88	29.93	---	SW	10	10	0.50	0.9	Overcast/ Mist
03/31/2001 06:29pm	57.2	55	63.4	50	94	29.94	---	WSW	9	9	3	0.9	Overcast/ Mist
03/31/2001 06:29pm	57.2	55	63.4	50	94	29.94	---	---	9	9	3	0.9	Overcast/ Mist
03/31/2001 06:50pm	57.2	55	63.4	48	94	29.94	---	W	11	11	3	0.9	Overcast/ Mist
03/31/2001 06:50pm	57.2	55	63.4	48	94	29.94	---	---	11	11	3	0.9	Overcast/ Mist
03/31/2001 07:50pm	57.2	55	63.4	52	94	29.95	---	W	8	8	3	0.9	Overcast/ Mist
03/31/2001 07:50pm	57.2	55	63.4	52	94	29.95	---	---	8	8	3	0.9	Overcast/ Mist
03/31/2001 08:50pm	57.2	55	63.4	50	94	29.96	---	WSW	9	9	3	0.9	Overcast/ Mist
03/31/2001 09:50pm	57.2	54	62.5	54	88	29.95	---	WSW	6	6	3	0.9	Overcast/ Mist

Figure 56 – METAR Historical Reports

8.17.8.3 METAR Raw Data

The raw METAR data is located in the following file location:

\metar\KABC.txt

where KABC is the METAR identifier

2001/06/03 18:56

KPHX 031856Z 28010G15KT 10SM CLR 34/M01 A2967 RMK AO2 SLP025 T03391006 $

Figure 57 – Raw METAR Data

8.17.9 Learning More About METAR

To learn more about METAR, visit the United States Government **National Oceanic and Atmospheric Administration** Website at http://www.nws.noaa.gov/oso/oso1/oso12/overview.htm.

8.18 Weather Servers

You do not even need your own website to share your METAR data around the world. Weather Underground and Hamweather provide this service to you at no charge.

8.18.1 Weather Underground Weather Server

To register your weather station as a private weather station, select the Sign-up Your Station button and proceed by registering your weather station or select the following link:

http://www.wunderground.com/weatherstation/index.asp

Menu Shortcut: Servers ▶ Weather Underground

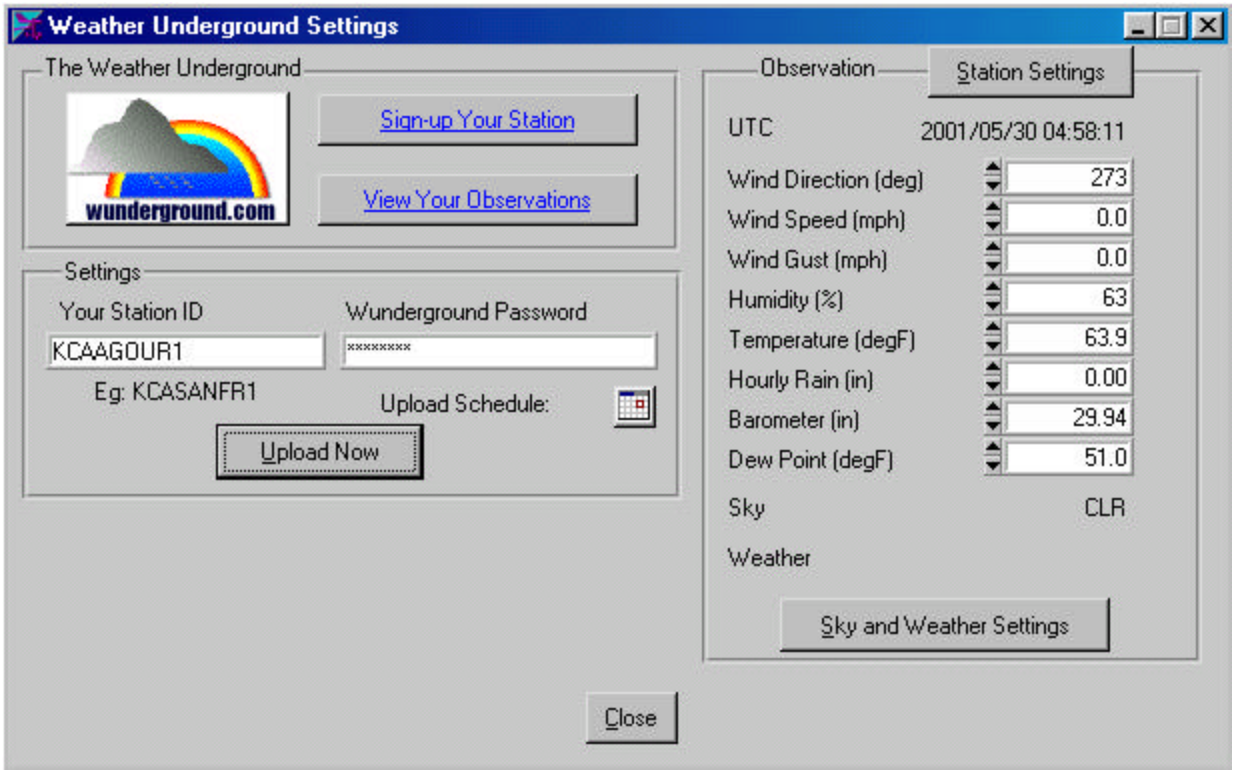


Figure 58 – Weather Underground Settings

8.18.2 Weatherforyou Weather Server

Weatherforyou.com and Hamweather.com have teamed to provide a powerful networking weather service for personal weather station owners.

To register your weather station as a private weather station, select the Sign-up Your Station button and proceed by registering your weather station at Hamweather.

Menu Shortcut: Servers ▶ Weatherforyou

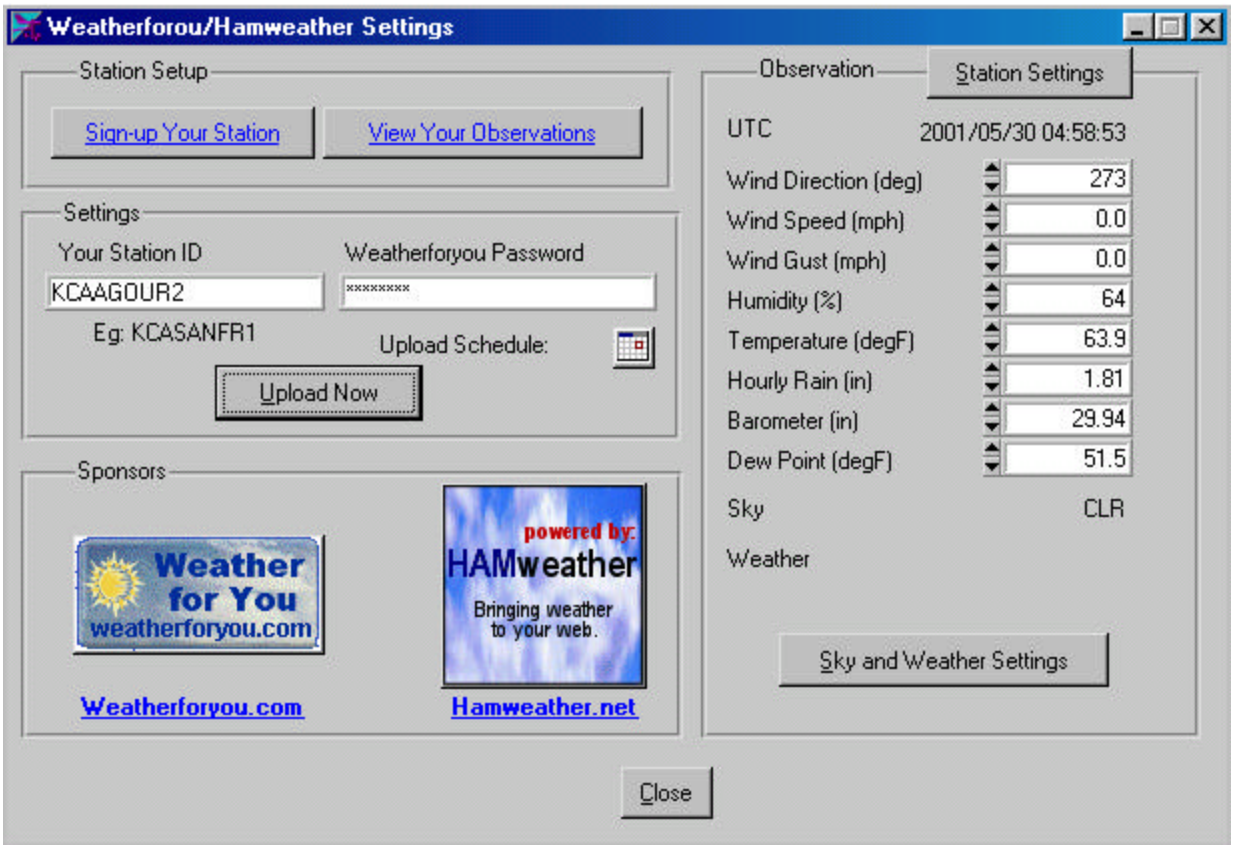


Figure 59 – Weatherforyou and Hamweather Server Settings

8.18.3 APRS

APRS is a which uses amateur radio to transmit position reports, weather reports, and messages between users.

Reference the links provided in **Figure 60 – APRS Settings** for more detailed information. Ambient does not actively participate in the APRS service, but provides the text files for generating APRS data in support of the network.

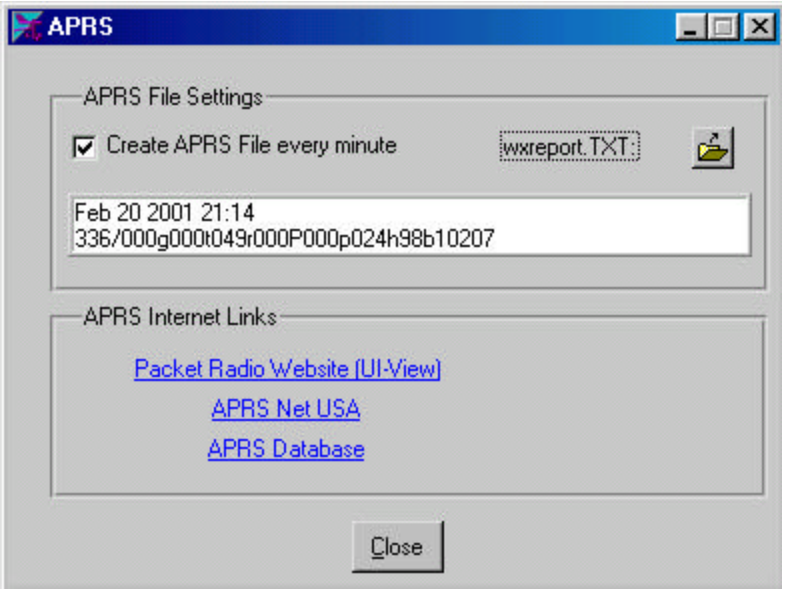


Figure 60 – APRS Settings

8.19 Internet Status and Log

8.19.1 Turning Off the Internet Functions

To turn off all internet functions, select the Turn Off All Internet Features switch.

8.19.2 Error Messages and Log

Error messages for Internet and communication events can be viewed from the Error Messages panel. To view the error messages panel, select [Help][Internet Error Messages and Log] from the menubar.

An Internet log captures events and errors during operation. To view this error log, select the open folder button. It is recommended you view this error log prior to contacting Ambient Software. Attaching this error log to an Email to Ambient Software is highly recommended to identifying problems. The error log is stored in \data\log.txt.

You can configure the software to write to the file (1) when an Internet related event occurs or (2) an Internet related error occurs.

- **NOTE:** The Internet log file can get very large. It is recommended that the log file record fault data only unless advanced troubleshooting is required, and the size of this file is monitored.

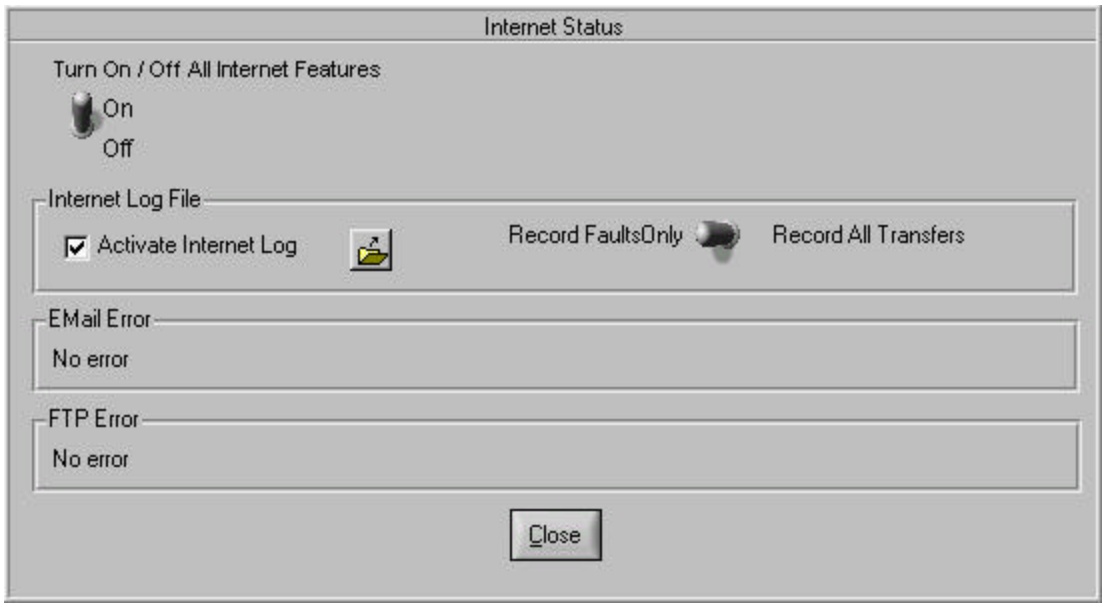


Figure 61 – Internet Status Messages and Error Log

9 Purchase Information

To register Virtual Weather Station, contact Ambient Software at http://www.ambientsw.com/Purchase.htm for details. You will receive a registration number. To enter the registration number, select [Help][Registration] from the Menubar.

10 NOAA Weather Server File Index

The following is a list of files available from the NOAA server that can be downloaded automatically and inserted into your web page using the File Tag feature.

Note: The NOAA server can be extremely slow at times.

File Location	Description
ftp://weather.noaa.gov/data/climate/daily/	Daily Climatological Report
ftp://weather.noaa.gov/data/forecasts/air_quality/	Air Quality Forecast
ftp://weather.noaa.gov/data/forecasts/city/	City Forecast
ftp://weather.noaa.gov/data/forecasts/extended/	Extended Forecast
ftp://weather.noaa.gov/data/forecasts/marine/coastal/	Coastal Marine Forecast
ftp://weather.noaa.gov/data/forecasts/marine/great_lakes/	Great Lakes Marine Forecast

File Location	Description
ftp://weather.noaa.gov/data/forecasts/marine/high_seas/	High Seas Marine Forecast
ftp://weather.noaa.gov/data/forecasts/marine/near_shore/	Near Shore Marine Forecast
ftp://weather.noaa.gov/data/forecasts/marine/offshore/	Coastal and Offshore Marine Forecast
ftp://weather.noaa.gov/data/forecasts/marine/weather_stmt/	Marine Weather Statement
ftp://weather.noaa.gov/data/forecasts/nowcast/	Short Term Forecast
ftp://weather.noaa.gov/data/forecasts/recreation/	Recreational Forecast
ftp://weather.noaa.gov/data/forecasts/state/	State Forecast
ftp://weather.noaa.gov/data/forecasts/zone/	Zone Forecast
ftp://weather.noaa.gov/data/observations/state_roundup/	Area Conditions
ftp://weather.noaa.gov/data/records/	Record Weather Events
ftp://weather.noaa.gov/data/summaries/area/	Area Weather Summary
ftp://weather.noaa.gov/data/summaries/max_min_temp_and_precip/	Temperature and Precipitation Report
ftp://weather.noaa.gov/data/summaries/weather/	State Weather Summary
ftp://weather.noaa.gov/data/watches_warnings/fire_weather/	Fire Weather Information
ftp://weather.noaa.gov/data/watches_warnings/flash_flood/statement/	Flash Flood Statement
ftp://weather.noaa.gov/data/watches_warnings/flash_flood/warning/	Flash Flood Warning
ftp://weather.noaa.gov/data/watches_warnings/flash_flood/watch/	Flash Flood Watch
ftp://weather.noaa.gov/data/watches_warnings/flood/coastal/	Coastal Flood Statement
ftp://weather.noaa.gov/data/watches_warnings/flood/statement/	Flood Statement
ftp://weather.noaa.gov/data/watches_warnings/flood/warning/	Flood Warning
ftp://weather.noaa.gov/data/watches_warnings/non_precip/	Urgent Weather Message

File Location	Description
ftp://weather.noaa.gov/data/watches_warnings/severe_weather_stmt/	Severe Weather Statement
ftp://weather.noaa.gov/data/watches_warnings/special_marine/	Special Marine Warning
ftp://weather.noaa.gov/data/watches_warnings/special_weather_stmt/	Special Weather Statement
ftp://weather.noaa.gov/data/watches_warnings/thunderstorm/	Severe Thunderstorm Warning
ftp://weather.noaa.gov/data/watches_warnings/tornado/	Tornado Warning

Table 12 – Weather Server Index

11 Troubleshooting Tips

Problem	Solution
The program is not communicating to the weather station (the instrument panel is not updating)	• Verify you have selected a Weather Station. • Verify that you have the correct communication port selected. If you are unsure which comport is correct, select **[Start][Settings][Control Panel]** from the **windows** menubar and **select [System][Device Manager] and Ports**. If COM1 is designated, your comport is Communication Port 1. • Verify you are using the proper cable. A standard 9-pin serial cable is required. *Do not use a NULL modem cable.* • If another program is using the serial communication port, quit the program. Two programs can not share the same serial port. • If you own a Palm Pilot or similar device (such as a digital camera), the software is often configured to open at startup of your computer, and "steals" the serial comport, even if the device is not connected. Select "Ctrl-Alt-Del" once, and see if any external device software is running. • Verify your station is not running on batteries and is connected to AC power.

Problem	Solution
	• Your communication port is locked-up. Cycle power to the computer • Your weather station console's communication port is locked up. Cycle power to the console. • You have a hardware device conflict. It is recommended that you contact your PC vendor or PC technical support. • Your serial port uses a non-standard IRQ line • Your serial port is defective • Your weather station serial port is defective. Unplug the station's AC adapter from the utility and run the station on battery power. If the LEDs display communication, reconnect the station's AC adapter. If the unit stops communicating again, contact Oregon Scientific. • See Advanced Communication Troubleshooting Tips
Communication only occurs while on the batteries and not the AC.	If RTS (request to send) control line is low, communications will only occur when on batteries. This condition will occur if you are using a 3-wire (pins 2,3,7) serial cable, or if for some other reason, the computer serial port is not asserting RTS. Use a standard 9-pin serial cable.
A script error or fatal error occurs during installation.	• Close all programs before installation. If the problem persists, reboot your computer and make sure no programs are running. • Turn off the virus protection. This can interfere with the installation process.
The program crashes or you receive the following Windows Message: "This Program Has Received an Illegal Operation and Will Shut Down"	• If your microprocessor is overheating, you may receive this message from the operating system. Keep your computer in a cool place to reduce crashes • Some low power mode or power savers will cause the program to crash when communicating to the serial port. Turn off the power saver by selecting Right Click on the desktop, Properties, Screen Saver, Settings (Energy Savings Features of Monitor), and Turn off monitor.

Problem	Solution
	• Your graphics or display card driver may be outdated or incompatible. Virtual Weather Station uses high resolution graphics that all display drivers must support. However, display cards and their associated drivers are notorious for incompatibilities with the Windows Operating System. You can determine your graphics card manufacturer by selecting Right Click on the desktop, then Display Properties, Settings and Advanced Properties. You may be able to download the latest graphics driver from the manufacturer by performing a search on the adapter part number and chip type.
The mouse moves on it's own or does not operate after launching the software.	• You have an IRQ conflict between the serial port and the mouse. • The solution is to replace your serial mouse with a bus mouse that resides on IRQ-12. This is not a problem with the software but is a hardware conflict associated with your computer. For more on IRQs, see Microsoft's troubleshooting hints.
How do I find the longitude and latitude for my location?	• You can contact your local town hall or city administration, but the best source of information is on the Internet. MapBlast at www.mapblast.com provides this information. Enter your address and the longitude and latitude will be displayed in decimal form. Select this link and the information will be converted to the degree format.
The Sunrise and Sunset Times are Incorrect	• Verify that the time zone is entered correctly. • Verify that the longitude and latitude are entered properly. • Make sure you do not have the latitude and longitude switched • Verify that the hemisphere settings are correct. • The celestial calculator is a close approximation of the sunrise and sunset in your location and may be inaccurate by several minutes due to equation inaccuracy or your altitude (the equations are based on sea-level).

Problem	Solution
	You can account for this inaccuracy by entering a number in the offset (-60 minutes to +60 minutes).
Sunrise and sunset are off by one hour, or did not change with the Daylight Savings Time Change.	• This problem may be related to the operating system's daylight savings time clock. The clock may not be available on your system. To account for this problem, enter an offset of +60 minutes or -60 minutes.
The strip charts lose the data when the program is shut down	Strip charts are intended for plotting data "real-time" and the data is not saved permanently to a file. Reference the section on graphs vs. strip charts.
The minimum and maximum daily values are not correct	Virtual Weather Station must be running to record daily highs and lows (data not stored in your weather station's memory).
Rate of changes are not correct	Rate of change is set to zero when Virtual Weather Station is started. Virtual Weather Station calculates the rate of change by calculating the derivative of a parameter, and then filtering it over one hour. Thus, the rate of change equation factors all of the measurements taken in the last hour, and may not exactly match the change in one hour. Determining the actual change in one hour would require every measurement within the hour to be saved, which is not practical, and would require the software to be operational for more than one hour. Instead, Virtual Weather Station uses calculation techniques standard in the engineering community for calculating rate of change. Virtual Weather Station's rain rate may not agree with the rain rate calculated by the weather station because different techniques are used.
How do I display more decimal points for a parameter?	Change the precision from the display's attributes panel. For example, changing the precision to three will add three numbers to the right of the decimal point (1/1000ths).
The jpeg images are distorted	Power save mode must be turned off to prevent distorted images
Weather display image colors are poor quality	Virtual Weather Station prefers to run at High Color or 16 bit. Select **[Start][Settings][Control Panel]** from the **windows**

Problem	Solution
	menubar and **select [Display][Settings] and High Color**.
The software is consuming too much CPU resources	Reduce the number of displays
The graphical images are missing	You may be low on memory. Reduce the number of graphical images displayed.
The computer is low on memory	Reduce the number of displays. Too many displays may result in insufficient memory.
The graphs update slow or the program locks up when displays are updated	Reduce the length of time in your graphs. Select Plot Last x hours. Enter a number less than 240 hours (for example). Plotting 20,000 points on multiple graphs can cause long delays.
The font size is incorrect after changing the font type	Changing font type can also change the font size due to font size limitations. To restore default fonts, select the Default button from the font settings window and restart the program.
The Moonrise (or Moonset) is showing --- instead of the time	Approximately once a month, the moon does not rise (or set) on a given day.
There is no data in my graph or distribution chart when the program is started.	The chart will be empty if (1) the database is empty (example, when the program is first started, or (2) Data has not been collected in the plot time frame specified in the attributes window (the program was turned off).
The data in my graph is wrong. How can I fix it?	• This problem is generally a result of bad sensor data from your station, but can be repaired in your database. • The data shown in graphs is stored in the database. To fix this data, go to **[Settings][Database Settings]** and edit the database.
The data in my NOAA reports is wrong. How can I fix it?	• This problem is generally a result of bad sensor data from your station, but can be repaired in your archive memory. • The data shown in the NOAA reports is stored in the archive memory. To fix this data, go to **[Settings][Daily Archive]**, **[Settings][Monthly Archive]** or **[Settings][Yearly Archive]** and edit the data.

Problem	Solution
The data looks overwritten when opened from the file folder in Virtual Weather Station	• Virtual Weather Station launches Notepad to view text files. This is a problem with Notepad. Use another text editor such as Microsoft Word or Wordpad to view the data.
The display image colors are poor quality	Virtual Weather Station prefers high resolution or 16-bit color. Some images may result in poor quality at lower resolution settings.
The numerical markers on the ribbon and temperature displays are not evenly spaced	The software attempts to put a numerical marker at even increments, but this is not always possible. To improve your numerical marker increments, select a high and low range value that results in a difference of a multiple of 10. For example, a low of -40 and a high of 60 will provide a difference of 100. This will produce better marker increments then a low of -20 and a high of 100.
The Dew Point of the weather station is reporting "LL" or limited to 32°F (0°C) and Virtual Weather Station is reporting a value	The Oregon Scientific unit does not report dew points below 32°F (0°C) but Virtual Weather Station continues to report these values.
The sea-level barometer does not report what is entered in the Station Settings window.	Virtual Weather Station only reports the sea-level barometer from your station. Reference Section 6.7.3 for more details.
The software is reporting a cloud base when there are no clouds in sight.	This is only an estimate based on relative humidity and temperature. Other weather parameters affect the cloud base, and should only be used as an estimate.
A Virtual Weather Station parameter displays a different number than the station console	Make sure that you have not entered a calibration (reference Chapter 6.3). Changing the calibration of a sensor will not change the value on the display.
The Daily Rain is not correct	The program must be running at midnight for today's daily rainfall to be correct. The Weather Station does not store daily rainfall. The station only stores "yesterday's rainfall".
The monthly rainfall reported in the NOAA report does not	This is due to the station total rainfall reset by the user, or the values for minimum or maximum rain edited by the user.

Problem	Solution
agree with the sum of the daily rainfall.	Reference 6.18.2 for more details to correct this.
Yesterday's rain as reported by the weather station is not the same as yesterday's rain recorded in the summary panel.	This is due to the unusual way the Oregon Scientific weather stations report rain. The station does not store today's rainfall, but only stores yesterday's rainfall. If the software is not running 24 hours per day, it may record an incorrect total for today's rain. When the day changes, the value reported by the station may be in disagreement from the value calculated by the software.
How do I change my NOAA report data?	This is done in the Archive Settings window, and not the database. Reference Section 7.2 for more details.
When I update one of the fields in the daily summary data, this change is not updated in the monthly or yearly summary data.	You must edit each of these data fields. For example, if the minimum temperature on January 9, 2000 is changed, and it is the minimum for the month and year, you must change this field in the monthly summary panel and the yearly summary panel.
The Alarm Sound will not play	• This feature requires a sound card. • This is not a problem with VWS, but with your sound card. Contact your sound card manufacturer
Some of the check boxes on the Parameters Display Panel are dimmed	Not all parameters can be displayed with all of the weather elements. For example, graphs require historical data, and it does not make sense to plot sunrise.
The displays do not retain their position when exiting the program.	• Make sure you have enough memory in your computer to save the displays. The display positions are saved in the file **VWS\setup\position.bin**. If this file is corrupted, close VWS, delete this file and restart Virtual Weather Station. You will need to reset the displays again. • Try a different drive. The drive you installed Virtual Weather Station on may be read only.
After hiding Virtual Weather Station with the taskbar icon, and recalling the display by double clicking on the taskbar, the window does not refresh	This is a Windows problem. Minimize and maximize the application again to refresh.
One of the sensors is not	Virtual Weather Station requires all of your sensors to operate

Problem	Solution
updating, and VWS will not begin executing (WMR-918 or WMR-968 only).	to properly obtain data. If one sensor is not functioning due to batteries or interference, deselect this sensor. *See Section 6.5.5, Sensor and Battery Status (WMR-918 and* WMR-968 only) for more details.
My system clock is losing time when I run Virtual Weather Station.	• Use the Synchronization feature in Virtual Weather Station. Select Settings | Synchronize Date and Time from the menubar. Note - you must be the administrator on an NT machine for this to work. • You may have a bad ROM BIOS chip. • You may need a new battery on the motherboard. • Power management software in Windows can cause clock time loss. • It may be a Windows 95 and 98 problem. Windows NT handles this better because of the operating system design. When you connect your weather station to the communication port, Windows must process interrupts to read this data. With weather stations, this occurs every 3 seconds. This causes the clock to slow down. If your computer is running other utilities, the clock speed may be affected even more. *Your computer may need a tune-up*. Here are some useful hints: 1) Don't run continuous virus checking. Have virus scanner scan your files on a batch basis. Continuous virus checking slows down your computer. 2) I've had excellent luck with two parts of Norton Utilities: (a) Norton Optimization Wizard (gets your swap file to the right size) (b) WinDoctor. Run both monthly and let them tune your computer. 3) If you have a number of programs running in the taskbar or resident to your system, delete them. When you close all your programs you should only see about 6-7 programs in your task

Problem	Solution
	list. 4) Get enough memory (>64Mb). 5) Run as few real mode drivers as possible (take everything out of your autoexec and config.sys). 6) Its fun to load a lot of programs to try them out, but every one of them leaves traces behind in the form of .vxd's, .dll's, and registry entries that will eventually slow up your system beyond repair. In the meantime, they slow it down and cause odd functionality. 7) If all else fails, reinstall Win98. Don't just reinstall over your existing windows directory, either. Wipe out c:\windows and c:\program files and start again. You may have to spend 4 hours reinstalling your apps, but your computer will run faster, you will use less disk space, and it will be more reliable. • Download a Clock Synchronization program, which synchronizes with the atomic national clock. One example is www.beaglesoft.com
The language does not change when changed from English	Virtual Weather Station provides limited foreign language support. To change the titles to the language of choice, edit each individual display.
What are channels 1, 2 and 3?	Channels 1, 2 and 3 are designated channels for the optional sensors described in the section *Add-on Sensors*
I receive Invalid Page Faults and General Protection Faults in Kernel32.DLL	Invalid Page Faults and General Protection Faults in Kernel32.DLL are generally caused by a lack of system resources, out of date video drivers, or a corrupt swap/paging file. If you encounter the problem on a regular basis, the following instructions should help resolve the problem: 1. **Windows 95 users ONLY**. (Windows 98 users proceed to step 2.) If the kernel32.dll error occurs while you are browsing and you are using Windows 95, this problem could be occurring due to Windows 95 bug. The bug is present in earlier versions of Windows 95 and Microsoft has

Problem	Solution
	posted an update which resolves the problem. In order to determine which updates you need, **right**-click on the My Computer icon on your desktop and select Properties from the menu. Click on the General tab to make sure it is in front. If you have the version of Windows 95 on the left, you should follow the instructions on the right: 4.00.950 Install Service Pack 1 first, then install the Kernel 32 Update. 4.00.950a Install the Kernel 32 Update. 4.00.950B Service Pack 1 and Kernel Update not needed. 4.00.950C Service Pack 1 and Kernel Update not needed. **NOTE:** The kernel update should only be applied if you have already installed Service Pack 1 for Windows 95. If you have Windows 95 version 4.00.950 (with no letters after the number), you should first visit the following page for information on downloading and installing Service Pack 1: Windows 95 Service Pack 1 If you have Service Pack 1 installed, you will have Windows 95 version 4.00.950a. In that case, you should install only the Kernel 32 Update. The kernel update can be found here: Windows 95 Kernel 32 Update **Important:** The location of Microsoft's updates may change. If the links in this article do not bring you to the Microsoft update pages, use the search page on Microsoft's site in order to download the Service Pack and Kernel updates. If you have any questions

Problem	Solution
	regarding the Service Pack or Updates, please contact Microsoft for assistance. 2. Finally, make sure that Windows is configured to handle virtual memory (unless you are an advanced users who has configured a static swap file). 1. Click the Start button and select Settings, then Control Panel. 2. In the Control Panel window, double-click the System icon. 3. Click the Performance tab and then click the Virtual Memory button. 4. Click "Let Windows manage my virtual memory settings (recommended)". 5. Click OK as prompted until you return to the Control Panel window.
I am experiencing a memory leak.	Memory leaks are common with the Microsoft Operating System if functions are repeated over and over again (for example, When you run a program that uses Windows Sockets in Windows 95, a gradual increase in the memory used by the operating system may occur over time, especially if the program opens and closes a large number of sockets). It is a good practice to download the latest operating system version and patches from the www.microsoft.com website. In addition, the following link provides insight to operating system memory leaks: Microsoft Operating System Memory Leaks
System Socket Web Server Error	Check to make sure you are connected to the Internet, or you are not conflicting with another Web Server running on your PC. • Quit the Virtual Weather Station program and manually connect to the World Wide Web. • Relaunch Virtual Weather Station.
My modem connection will not hang up.	• Another application is dialing and taking over the modem when VWS dials. These “subversive” applications wait until you establish a connection to the Internet, and then download or upload data. Close all applications except VWS to see if this is the problem. Select Ctrl-Alt-Delete once to identify hidden applications

Problem	Solution
	• If you selected "Use Default Internet Connection" under Network Settings, The status = InternetAutodialHangup(0); function does not work, and will not hang the phone. Check out Microsoft's http://support.microsoft.com/support/kb/articles/Q235/6/66.ASP link for more information. • Low quality modems do not always respond properly to the Hang Command from the operating system.
I commonly receive timeouts during FTP	• Increase the CPU usage during FTP operation by selecting Internet | FTP General Settings | Max CPU During FTP
	•

Table 13 - Troubleshooting Tips

11.1 Advanced Communication Troubleshooting Tips

If you followed the troubleshooting tips above and could not find a solution, you likely have a problem with your station's communication port, the cable or your computer.

To verify that you are receiving data, launch Hyper Terminal, which is a terminal emulation program distributed with most Windows operating systems.

1. Launch Hyper Terminal, Select **[Start][Programs][Accessories][Hyper Terminal]** from your Windows Desktop.
2. Run Hyper Terminal by selecting the **Hypertrm** icon.
3. Enter a **Name** (any name is OK) for the connection description.
4. Select **Connect Using** and **Direct to Com x**, where x is the comport designation.
5. Select **9600 baud, 8 data bits, Parity None, 1 stop bit, Flow Control Hardware Control.**
6. You should see binary data on the display every time your station sends data (example, **!¤ P 3 ¼ Pyü**).
7. If you see data streaming on the display, contact Ambient, LLC (support@weatherconnect.com).
8. If you do **not** see data streaming on the display, please contact Oregon Scientific, your PC Manufacturer, or the cable manufacturer.

11.2 Support

For tips and troubleshooting, select the following link:

http://www.weatherconnect.com/support/

12 Glossary of Terms

The following is a glossary of weather and instrument terms.

Term	Definition
AIR DENSITY	The ratio of the mass of a substance to the volume it occupies. In oceanography, it is equivalent to specific gravity and represents the ratio of the weight of a given volume of sea water to that of an equal volume of distilled water at 4.0 degrees Celsius or 39.2 degrees Fahrenheit.
ATMOSPHERIC PRESSURE	See barometric pressure
BAROMETRIC PRESSURE	The pressure exerted by the atmosphere as a consequence of gravitational attraction exerted upon the "column" of air lying directly above the point in question. The measurement can be expressed in several ways. One is in millibars. Another is in inches or millimeters of mercury (Hg). Also known as atmospheric pressure.
BEAUFORT WIND SCALE	A system of estimating and reporting wind speeds. It is based on the Beaufort Force or Number, which is composed of the wind speed, a descriptive term, and the visible effects upon land objects and/or sea surfaces. The scale was devised by Sir Francis Beaufort (1777-1857), hydrographer to the British Royal Navy.
CALIBRATION ERROR	The inaccuracy that the manufacturer permits when the unit is calibrated in the factory.
CLOUD BASE	For a given cloud or cloud layer. The lowest level in the atmosphere at which the air contains a perceptible quantity of cloud particles. Virtual Weather Station estimates the cloud base on temperature and humidity readings, using the following equation: Cloud Base (ft) = 250(Temperature - Dew Point)
COOLING DEGREE DAY	A cooling degree day is given for each degree that the daily mean temperature departs above the baseline of 75 degrees a given temperature It is used to estimate the energy requirements, and is an

Term	Definition
	indication of fuel consumption for air conditioning or refrigeration. Refer to degree day or heating degree day.
DEW POINT	The temperature to which a sample of air must be cooled, while the mixing ratio and barometric pressure remain constant, in order to attain saturation by water vapor. When this temperature is below O°C, it is sometimes called the frost point.
GUST	A sudden significant increase in or rapid fluctuations of wind speed. Peak wind must reach at least 16 knots (18 miles per hour) and the variation between peaks and lulls is at least 10 knots (11.5 miles per hour). The duration is usually less twenty seconds.
HEAT INDEX	The combination of air temperature and humidity that gives a description of how the temperature feels. This is not the actual air temperature.
HEATING DEGREE DAY	One heating degree day is given for each degree that the daily mean temperature is below 65 degrees a given temperature. It is used as an indication of fuel consumption. Refer to degree day or cooling degree day.
HUMIDITY	The amount of water vapor in the air. It is often confused with relative humidity or dew point. Types of humidity include absolute humidity, relative humidity, and specific humidity.
LATITUDE	The location north or south in reference to the equator, which is designated at zero (0) degrees. Parallel lines that circle the globe both north and south of the equator. The poles are at 90 degrees North and South latitude.
LONGITUDE	The location east or west in reference to the Prime Meridian, which is designated as zero (0) degrees longitude. The distance between lines of longitude are greater at the equator and smaller at the higher latitudes, intersecting at the earth's North and South Poles. Time zones are correlated to longitude. See Greenwich Mean Time.
MOON PHASE	The moon phase is caused by sun rays reflecting off the moon's surface while it moves around the earth. The sun illuminates half of the moon at any time while the moon orbits around the earth. The variation in the angle made by the earth-moon line with respect to the earth-sun line causes changing phase of the moon. The moon completes one revolution around the earth in 27.322 days with respect to the background stars. This is called the SIDERIAL

Term	Definition
	period of the moon. During this same time the earth moves about 27 degrees along its orbit around the sun. As a result, the moon takes about two extra days to complete the cycle with respect to the sun-earth line. This longer cycle of the moon that takes about 29.57 days is called SYNDONIC period of the moon. The longer cycle is considered as Lunar month.
PRESSURE ALTITUDE	Atmospheric or barometric pressure expressed in terms of altitude which corresponds to that pressure in the standard atmosphere.
RATE OF CHANGE	The derivative or change in a parameters value with respect to time. Virtual Weather Station calculates the rate of change by calculating the derivative of a parameter, and then filtering it over one hour. Thus, the rate of change equation factors all of the measurements taken in the last hour, and may not exactly match the change in one hour.
RELATIVE HUMIDITY	A type of humidity that considers the ratio of the actual vapor pressure of the air to the saturation vapor pressure. It is usually expressed in percentage.
SEA LEVEL PRESSURE	The atmospheric pressure at mean sea level either directly measured by stations at sea level or empirically determined from the station pressure and temperature by stations not at sea level. Used as a common reference for analyses of surface pressure patterns.
SUNRISE	The daily appearance of the sun on the eastern horizon as a result of the earth's rotation. In the United States, it is considered as that instant when the upper edge of the sun appears on the sea level horizon. In Great Britain, the center of the sun's disk is used instead. Time of sunrise is calculated for mean sea level. See sunset for comparison.
SUNSET	The daily disappearance of the sun below the western horizon as a result of the earth's rotation. In the United States, it is considered as that instant when the upper edge of the sun just disappears below the sea level horizon. In Great Britain, the center of the sun's disk is used instead. Time of sunset is calculated for mean sea level. See sunrise for comparison.
VAPOR PRESSURE	The pressure exerted by water vapor molecules in a given volume of air
VIRTUAL	Virtual temperature is a fictitious temperature that takes into

Term	Definition
TEMPERATURE	account moisture in the air. The formal definition of virtual temperature is the temperature that dry air would have if its pressure and specific volume were equal to those of a given sample of moist air. Virtual temperature allows meteorologists to use the equation of state for dry air even though moisture is present.
WIND CHILL INDEX	The calculation of temperature that takes into consideration the effects of wind and temperature on the human body. Describes the average loss of body heat and how the temperature feels. This is not the actual air temperature.
WIND DIRECTION	The direction from which the wind is blowing. For example, an easterly wind is blowing from the east, not toward the east. It is reported with reference to true north, or 360 degrees on the compass, and expressed to the nearest 10 degrees, or to one of the 16 points of the compass (N, NE, etc.).
WIND RUN	The distance or length of flow of the air past a point during a given interval of time.
WIND SPEED	The rate of the motion of the air on a unit of time. It can be measured in a number of ways. In observing, it is measured in knots, or nautical miles per hour. The unit most often used in the United States is miles per hour.

Table 14 - Glossary of Terms

12.1 Beaufort Scale

The Beaufort scale is a system of recording wind velocity (speed) devised in 1806 by Francis Beaufort (1774–1857). It is a numerical scale ranging from 0 for calm to 12 for a hurricane.

Number and description	Features	Air speed	
		kph	mph
0 calm	smoke rises vertically; water smooth	0–2	0–1
1 light air	smoke shows wind direction; water ruffled	2–5	1–3
2 light breeze	leaves rustle; wind felt on face	6–11	4–7
3 gentle breeze	loose paper blows around	12–19	8–12
4 moderate breeze	branches sway	20–29	13–18

		Air speed	
5 fresh breeze	small trees sway, leaves blown off	30–39	19–24
6 strong breeze	whistling in telephone wires; sea spray from waves	40–50	25–31
7 near gale	large trees sway	51–61	32–38
8 gale	twigs break from trees	62–74	39–46
9 strong gale	branches break from trees	75–87	47–54
10 storm	trees uprooted; weak buildings collapse	88–101	55–63
11 violent storm	widespread damage	102–117	64–73
12 hurricane	widespread structural damage	above 118	above 74

Table 15 - Beaufort Scale

12.2 Heat Stress Index

The Heat Stress Index calculates the body's reaction to heat and humidity, or the Heat Index. High temperatures and humidity stress the body's ability to cool itself, and heat illness becomes a special concern during hot weather.

Do not base important decisions on this heat stress index! Everybody's reaction to heat is different.

Scale	Condition
---	Heat Index < 80 °F
Caution	80 °F < Heat Index < 90 °F
Extreme Caution	90 °F < Heat Index < 105 °F
Danger	105 °F < Heat Index > 130 °F
Extreme Danger	Heat Index > 130 °F

Table 16 - Heat Stress Index

12.3 Comfort Index

The comfort index calculates the body's reaction to heat, cold, humidity and wind chill. High

temperatures and humidity stress the body's ability to cool itself, and low temperature can stress the body's ability to heat itself.

Do not base important decisions on this comfort index! Everybody's reaction to heat and cold is different.

Scale	Condition
Extreme Cold	Wind chill < 0 °F
Uncomfortably Cold	0 °F < Wind chill < 30 °F
Cool	30 °F < Wind Chill < 60 °F
Comfortable	60 °F < Temperature < 80 °F
Warm	80 °F < Temperature < 90 °F
Uncomfortably Hot	Temperature > 90 °F and Heat Index < 100 °F
Extreme Hot	Heat Index > 100 °F

Table 17 - Comfort Index

13 Add-on Sensors

Menu Shortcut: Help ▶ Add-on Sensors

Oregon Scientific will be releasing add-on sensors, which will be integrated into VWS as they become available.

The following is a list of available sensor upgrades.

Product	Picture	Description
THC-238 for use with the WMR-918 and WMR-968 Water proof Temperature	 THC-238 for the WMR-918 and WMR-968	Visit www.weatherconnect.com/thc238 THC-238 Optional Water Proof Probe Sensor for the WMR-918 or WMR-968 Communicates directly to your WMR-918 and WMR-968 Weather Stations. Add three additional sensors for the ultimate in real-time weather monitoring. • The transmitter with water proof probe can be placed anywhere that temperature monitoring is necessary... measure soil temperature, pond temperature, lake temperature, A/C or Heater Duct temperature, water pipe temperature,... up to 120 feet (less through walls etc.) away. • Oregon Scientific Wireless indoor/outdoor monitors allow an additional three sensors • Digital display shows temperature Sensors can be placed up to 120 feet from main display unit • Operates on 2 AA batteries (included) Can also use Lithium AA for very cold conditions • Deg F or C Display... 3 channel displays (allows you to add three additional sensors to the WMR-918 or WMR-968 weather station). • Outdoor range (4F) to 140F

Product	Picture	Description
THGR-238 for use with the WMR-918 and WMR-968 Temperature and Humidity	 THGR-238 for the WMR-918 and WMR-968	Visit www.weatherconnect.com/thgr238 • Add Up to Three Additional Temperature and Humidity Sensors to the WMR-918 or WMR-968 • For use with the Oregon Scientific WMR-918 / 968 weather stations • Digital display shows humidity and temperature • Sensors can be placed up to 120 feet from main display unit • Operates on 2 AA batteries (included) • Can also use Lithium AA for very cold conditions • Deg F or C Display... 3 channel displays. • Outdoor range (- 58F) to 158F

Table 18 - Add on Sensors